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THE JOURNAL OF DENTAL EDUCATION

A QUARTERLY FOR THE DENTAL TEACHER

VOLUME 15 MAY, 1951 NUMBER 4

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VOLUME 15 MAY, 1951 NUMBER 4

JOURNAL of DENTAL EDUCATION

Contents

Editorials:

On Teaching Dentistry for Children 209

New Date of Publication 212

A Technic for Making Teaching Models for Use in Oral Surgery, *C. D. Gwinn*, D.D.S. et al. 213

Teaching Dentistry for Children:

Introduction, *Lloyd E. Blauch*, Ph.D. 222

The Present Study of the Program, *Kenneth A. Easlick*, D.D.S. 222

Public Interest in Oral Health Care for Children, *John J. Fulton*, D.D.S. 223

Oral Health Needs, Personnel, Facilities, and Plans for Supplying Those Needs, *John W. Knutson*, D.D.S. 231

Research in Dentistry for Children, *Francis A. Arnold, Jr.*, D.D.S., and *H. A. Zander*, D.D.S. 236

The Development of a Pattern of Instruction, *John C. Brauer*, D.D.S. 241

Content of the Teaching Program, *Ruth E. Martin*, D.D.S. 246

The Survey: A Questionnaire, *Ralph L. Ireland*, D.D.S. 252

The Relationship of Instruction to Instruction in Other Fields, *H. M. Wilbur*, D.D.S. 255

A Recommended Under Graduate Program, *Kenneth A. Easlick*, D.D.S. 259

College News 270

Book Announcements 272

Index to Volume 15 277

Philosophy is the interpretation of the meaning of facts.

—Author Not Known.

EDITORIALS

On Teaching Dentistry for Children

The above title and the principal contents of this issue of the JOURNAL pose some three or four questions. Ordinarily, it may not be desirable to discuss the matter in the text editorially, in the same issue, though there are times when that idea may be violated. The questions brought out may be stated as follows:

1. Why "Children's Dentistry."
2. A Brief History of Dentistry for Children.
3. Autonomy in Dentistry.
4. A Philosophy of Dentistry.

I.

This question may be asked and answered from two standpoints: first, why give attention to children, and second, by virtue of the designation "children's dentistry," why distinguish it from any other phase of dental practice? It is to the latter of these two to which attention should be drawn. Children's dentistry does not differ essentially from any other phase of operative dentistry. However, two points might be brought to mind. The child requires to be handled differently than an adult, so that one to be successful in dealing with children must, above all else, think in terms of children. So far as operative procedures are concerned, these are virtually the same as for adults requiring only to be modified primarily in terms of a slightly different tooth morphology, much being dependent upon the age of the child. These are the real factors entering into consideration of children's dentistry. Another factor relates entirely to the term "Children's Dentistry." It does not appear well to designate a phase of dental practice as "children's dentistry" for it is ostensibly "dentistry for children" and it should be "adult dentistry for children." In a story "Adult Dentistry for Children," the author, Dr. Cody,[1] has given emphasis to dental practice among children which carries with it a positive note of substantiality.

II.

Almost the entire history of dentistry can be written within the years 1900 to 1950. Prior to 1900, considerable was written on the care of children's teeth, the sum total of which amounted to very little, if any, from the standpoint of value to the child. Extraction of deciduous teeth and often times first permanent molars was about the only phase

[1]Cody, William E., D.D.S.: Adult Dentistry for Children, *Journal, Colorado State Dental Association*, 29, 7; 1951.

that was permanent. There simply was nothing known or taught on this very important subject. Soon after 1900, Dr. Evangeline Jordan, with offices in Los Angeles, established a practice among children, but it was not until about 1919 that Dr. H. C. Puckett, an Illinois dentist, took the first course offered by the Forsythe Infirmary in Boston, after having previously practiced a few years in Illinois. He located in Seattle, Washington, where he practiced real dentistry for children; amalgam fillings, root canal therapy, extractions, and everything that might be done for a child or for an adult, bearing in mind the same thought concerning morphology of the teeth as suggested above. And this was done with the use of novocaine and block anesthesia, which were the terms in common use of that day. To this man belongs the real credit for the introduction of this "new look" in the practice of dentistry for children. Wouldn't the subject better be "Dentistry for Children" rather than "Children's Dentistry"?

III.

Dentistry as a profession began its ministrations in the years before the beginning of the Christian era, primarily in relief from pain by those who classed themselves as physicians and ministered to the needs of people in health matters, or more particularly in their distress. As time went on, even these began to specialize so that, among others, we had those who treated the teeth. Jumping over the years into the nineteenth century, we find men still picking up whatever they could to make dentistry more serviceable until, in 1840, the first dental school in the world was organized. This school was organized by dentists and for the education of dentists. From that beginning, dentistry has advanced with "ups and downs" through the years until today we have some 52 schools, integral parts of universities with but one or two exceptions. These exceptions, however, are all but under university control. This has been accomplished by dentists. The profession has, to that extent, risen by its own efforts and in larger part at least, the law governing the practice of dentistry, which is society's provision for various trades and professions, is directed by the profession. Two questions may be said to indicate autonomy or lack of it as pertains to any school.[2]

1. Does the Dean submit his budget directly to the President or does it go through the Dean of another School; for example, the Medical School?
2. Who has control over the curriculum—can the Medical Dean or Medical Faculty overrule the Dental Dean or the Dental Faculty?

[2]Fleming, Willard C., Dean, College of Dentistry, University of California; Personal Communication.

To these may be added a third, not proposed by Dean Fleming:

3. Is there a Dean of the Dental School, appointed by the President or is he an associate of the Medical School Dean?

The question of autonomy has been the prime reason for battles within the profession, and within the two professions, medicine and dentistry, in the years gone by, and yet it was in major part settled some 25 or more years ago as the result of a survey conducted by the Carnegie Foundation and under the direction of William J. Gies, Ph.D., and submitted in his report known as Bulletin No. 19, 1926. In the years following the issuance of this bulletin all dental schools but one were or became autonomous in their university relationships, in that they complied affirmatively with the above stated questions. One school did not, but continued to use an Administrative Officer in the dental school, as associate of the Medical Dean. Within the past few years two schools apparently threw off any appearance of autonomy, continuing dental education within their universities, but as a part of the Medical School. After a brief time one of these reverted to the old order and was immediately approved by the Council on Dental Education. Within the last few weeks, the second of these two schools has been approved by the Council on Dental Education, apparently meeting all requirements. To those on the outside, however, this does not appear to be wholly true, for the Director of the Dental School is an associate of the Dean of the Medical School, although he himself is a dentist. There is probably one question yet to be answered as pertains to the autonomy of this school and the complete autonomy of other schools. Can a school or college of a university be autonomous and at the same time be brought into the university family through another school or college or department? Apparently most dentists think not and we do look forward to the time when this last Dental School, Columbia University, may have a Dean of its own and may enjoy complete autonomy in that great institution.

IV.

The philosophy of dentistry should be answered now, very briefly. The term itself refers to the object to be attained, that is, what is the object as relates to its particular ministration. Dentistry has come through at least two eras; namely, cure and control, and is now looking into the face of the third, prevention. Of course, we are never competely out of one or wholly in another, there being a certain amount of overlapping, but briefly, the philosophy may be stated: it is an "art which aims at the preservation of the natural teeth in a state of health and beauty. Its highest office is to prevent disease or deformity, but where

either of these has already occurred, it is then its function to remedy the evil and check its further progress."[3]

This is an old statement made nearly 50 years ago; however, its truth still obtains, qualified by our further knowledge and especially of the so-called basic sciences, all of which are turning our attention definitely to prevention, which begins with the child. This emphasizes to us the fact that we must think in terms of "means to an end" rather than an end in itself. Dentistry for children is a most important phase of dental practice, not only from the health standpoint of the public, but from the professional standpoint of dentists, and the philosophy of dentistry becomes one which points the way both to patient and practitioner, for a fuller enjoyment of all that is available to us and a fuller realization of our ethical and moral relationships.

New Date of Publication

Beginning with the next volume of the JOURNAL, the publication date will be changed to that of a calendar year. The first issue of Volume 16 will appear in January. This has been approved by the Executive Committee.

Wisdom is divided into two parts—(1) having a great deal to say, and (2) not saying it. —SELECTED.

[3]Johnson, C. N., D.D.S.: Textbook of Operative Dentistry, P. Blakiston & Co., Philadelphia, 1909, p. XI.

A TECHNIC FOR MAKING TEACHING MODELS FOR USE IN ORAL SURGERY[1]

C. D. GWINN, D.D.S., D. H. GRIMM, D.D.S., M.S., and
G. L. ALBERTSON, B.S., D.D.S., *San Francisco*

Models have been used in dentistry for demonstration purposes for many years. Our purpose in undertaking this work was to develop a method of making durable demonstration models that would show various steps in our oral surgical procedures. These models were to be shown to small groups of students in connection with their clinical work. It was also expected that they could be taken by various members of the staff and demonstrated in table clinics before dental groups. For these reasons it was necessary to construct them of some material that would be durable enough to allow fairly rough handling.

Soap models as carved by Dr. Cogswell, although illustrating various steps very beautifully, were thought to be entirely too delicate for such work.

Acrylic was selected as the material of choice both because of its durability and adaptability and because of the colors that could be easily obtained.

We were aided in overcoming the technical difficulties encountered in the making of molds for reproducing models of the mandible and maxilla by Dr. Charles Lipp of the division of oro facial prosthesis. The laboratory work pertaining to the flasking, curing and polishing was done by Mr. Harry Tiedeman, a dental student.

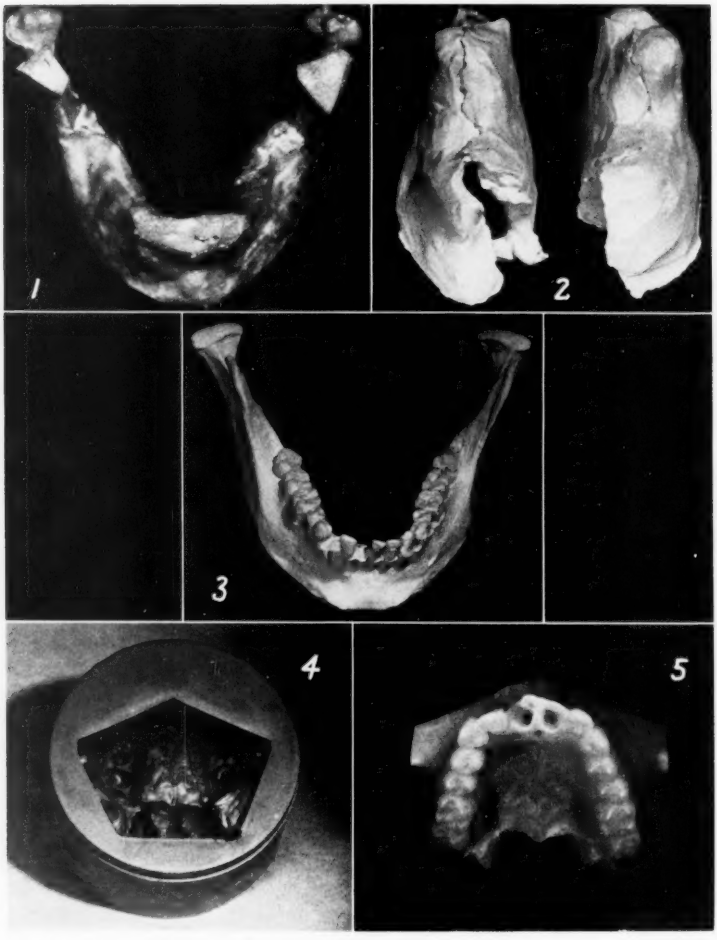
In making this series of models the "master model" was the human maxilla and mandible with a few modifications, such as the teeth (porcelain technic) and the simulated tissue thickness.

Part I

The technic for reproducing the maxilla and mandible are similar and is as follows:

An impression is taken of the natural bony maxilla or mandible by using Latex[2] which is applied in very thin layers, completely covering the entire surface of the object. After two or three layers of Latex have been applied the impression is reinforced by placing gauze on the sticky surface of the Latex and then adding more Latex until a thickness of about two millimeters is built up. The whole impression is allowed to

[1]From the Division of Oral Surgery, University of California College of Dentistry.
[2]General Latex and Chemical Corporation, 666 Main Street, Cambridge, Mass.



dry for about 12 hours. Figure 1 shows the completed impression. Before the Latex impression is removed from the maxilla or mandible a plaster shell is made so that on separation the impression can be held without excess distortion while a duplication is being made. The plaster shell is shown in Figure 2. The plaster shell is then removed and the Latex impression cut along what would be the lower border in the case of the

mandible and a section cut out of the base area of the maxilla so that these impressions can be separated from the bony maxilla or mandible. The impression and plaster shell are then reassembled and a stone model made. Figure 3 shows the stone model. Though Latex is very accurate and can be used for duplication, it is not durable enough for the repeated duplication with hot wax; so the next step is to make a permanent mold that can be used over and over again.

The material used in this technic for a durable mold is Plastiflex,[3] which is a trade name for a synthetic rubber-like thermoplastic mold material that can be used involving temperatures of not over 220° F.

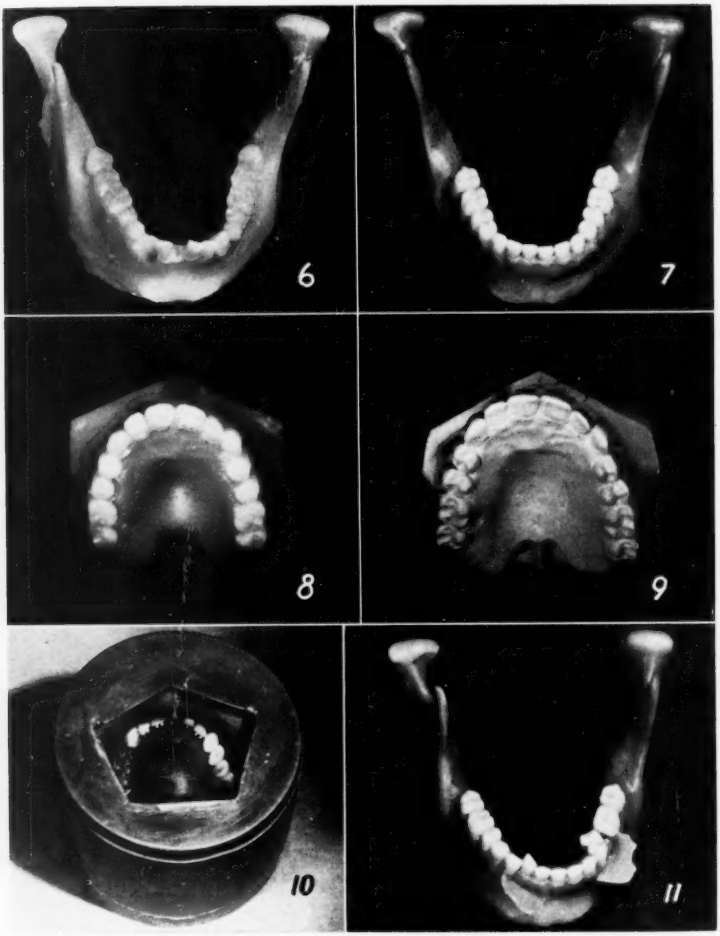
The stone model does not necessarily have to be thoroughly dry, but it should be soaked in linseed oil, soap, or given a coat of paste or liquid wax. The treated model is then placed on a metal base and a large flask that is open at both ends used for the retaining wall. A reasonable space should be allowed around and above the model to provide the side walls and bottom of the Plastiflex mold to be made. The Plastiflex is then melted in a double boiler over gas heat using a high flash-point oil for the bath. The best pouring temperatures were from 320° F. to 340° F. The Plastiflex should be poured in a steady and uninterrupted stream, so that the stream does not touch the model and the Plastiflex allowed to gradually rise around and encompass the model. The surface of the Plastiflex is then flamed to bring any bubbles formed to the surface. The mold is allowed to set, the time involved varying as to the mass. Figure 4 shows the completed mold of the bony maxilla.

Though we now have a master mold, we still have to set up teeth and add a thickness of wax to simulate tissue in order to make a natural appearing maxilla or mandible on any model poured from this mold. If this had to be done for every model to be made it would consume a considerable amount of time. For this reason another master mold is constructed to take care of this step.

First, after pouring a wax model from the first master mold, porcelain technic teeth are set up in the correct relationship along with more wax to give the appearance of normal gum tissue. Figures 5 and 6 show the crude wax models and Figures 7 and 8 show the teeth and tissue added. Another Latex impression is made and treated as before and a stone model is poured from this impression. This stone model is shown in Figure 9.

A second master mold is made using the Plastiflex material again and repeating the technic as previously described. This time before wax is poured into the permanent mold porcelain technic teeth are first set in

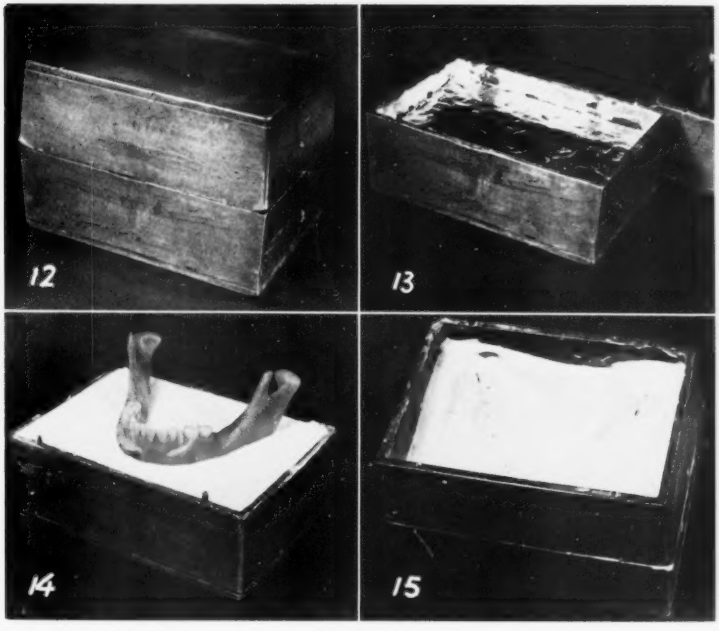
[3]Calresin Corporation, 8564 Washington Boulevard, Culver City, California.



the mold and then the wax poured. This is shown in Figure 10. The completed wax models look exactly like the ones in Figures 7 and 8.

We are now ready to build up a series of models on some particular oral surgical procedure in wax, such as the removal of a displaced lower second bicuspid and lateral. The various steps that are to be shown are carved in the wax master models and the series completed. The next

and final step is the changing of these models into a permanent substance that can be handled and examined and still retain its original shape. The material that seemed to best combine natural appearance and durability was pink acrylic. So the second part of this article deals with the transferring of these wax models into acrylic. In cases where roots of teeth are required for these models, such as the steps in the removal of a lower impaction, acrylic teeth are made complete with roots.



PART II

A regular flask is used for the maxillary models, but a much larger flask is needed for the mandibular models. The flasking and curing of both the maxillary and mandibular cases are essentially the same but due to the size of the mandible the flasking and curing procedure is more difficult. Figure 11 shows the wax model before flasking. Figure 12 shows the type of flask used for the mandibular models.

When using a large deep flask such as that used for a full mandible, the base is filled to within one inch of the rim of the flask. If stone is used for this part it should be left in the flask indefinitely.

A sheet of tin foil is then placed over the stone base and the remainder of the base filled with a smooth, rather thin mix of plaster. This is shown in Figure 13.

This mix of plaster is used wherever strength is unnecessary because it is much easier to remove and in this type of work there is no concern about a little distortion.

The wax model is then washed with a detergent and rinsed to remove grease and reduce the surface tension. Then a thin coat of plaster is painted on the wax up to the point it will be immersed in the first flasking.

This painted model is now placed into the base which has been filled with plaster. Figure 14 shows this step.

If there are any flaps or other rather fragile protuberances, do not embed them in first flasking.

When hard, paint plaster with green soap, water glass or some other separator and place upper half of flask in place.

If there are any areas that are especially weak, such as sockets, flaps, or impacted teeth with only a small portion showing, these areas should be reinforced first with a covering of stone.

A smooth mix of plaster is then vibrated into the upper half of the flask and carried to but not beyond the incisal and occlusal surfaces of the teeth. In the case of a full mandible, cover to the occlusal surfaces, anterior border of the ramus, coronoid process, down into the notch and then to the head of the condyle. Figure 15.

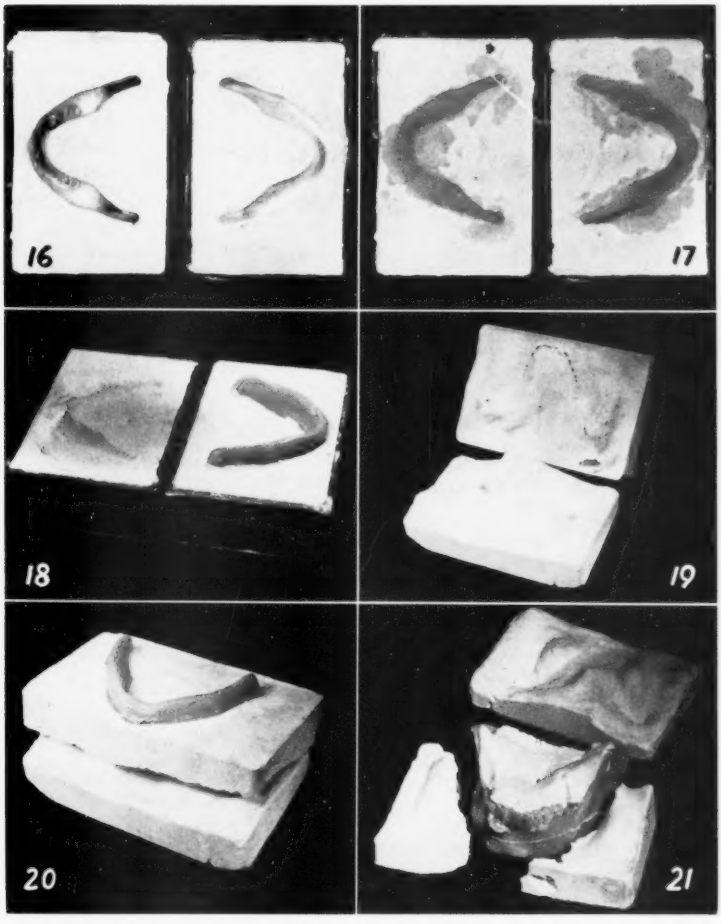
When this section is hard, paint on a separator and fill the flask with more plaster. The lid is now fitted on the flask.

When plaster is set, the flask is placed in warm water and the water heated to a point where it is too hot to touch but not hot enough to melt the wax to a liquid state. The flask is so large that boiling water will heat outside areas and melt wax before the center part. In the melted parts the dye comes out of the wax, lodges in the recesses where it is impossible to remove. By having the water at a temperature where the flask can be heated throughout without completely melting the wax, the flask can be opened and most of the wax removed in one piece. By using the technic the wax is soft enough to pull away from the teeth and undercuts without breaking or pulling anything loose.

The remainder of the wax is washed out using boiling water containing a household detergent. Figure 16.

While hot, paint all model surfaces of both sides of the flask with one of the liquid substitutes for tin foil.

When the flask is cool, mix the acrylic. Shape the acrylic roughly to desired shape of area to be filled and force into place with fingers. Since



both sides are negative, and in the case of a mandible have a very narrow packing area, the acrylic has to be well adapted before trial packing.

A double thickness of cellophane is now placed over the acrylic, the flask closed and pressed in a bench press.

Increase pressure gradually until closed or until no more excess runs out. Because of the great bulk and also because there is no cause to worry about bite openings much more pressure is used than on dentures.

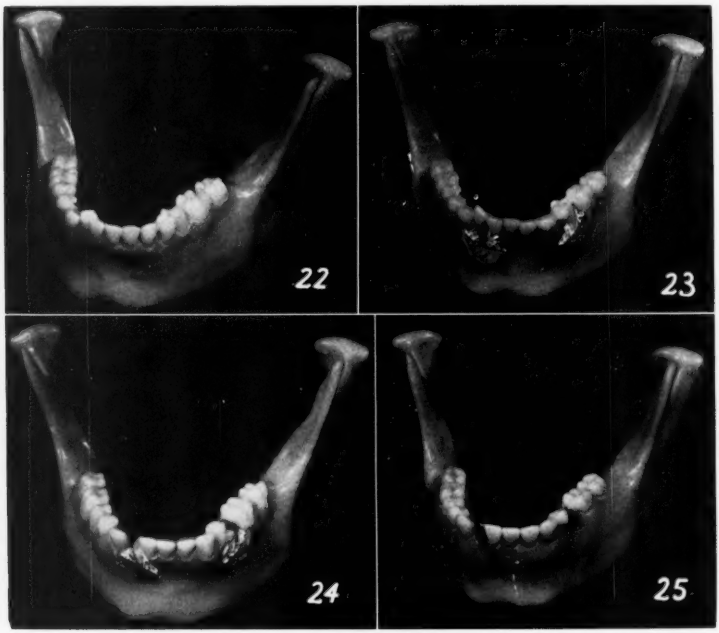
The flask is now opened, the excess trimmed off and more material added. This process should be repeated until the acrylic looks quite dense. Figure 17 shows the excess of acrylic.

On the final closing more acrylic is added. If the acrylic has begun to harden, the surfaces are coated with monomer before the final closing.

On application of pressure the flask should show about one or two millimeters of opening between halves. This insures continued pressure and compensates somewhat for the shrinkage that takes place during the curing.

The flask is now placed in hot tap water and cured at a temperature of 165° F. for at least six hours. It can be bench cooled or left in water bath until it reaches room temperature.

The deflasking procedure consists of first removing the flask lids and then since the bottom half of the mold was flasked so that no undercuts were covered, the flask can be pried apart allowing the lower part of the model to separate from the lower half of the flask and remain with the other half. Figure 18.



The upper half of the flask should be tapped so that the plaster will loosen. The section covering the teeth is now pried loose from the remainder of the upper part. This is shown in Figures 19 and 20.

Several cuts should now be made with a saw toward the model, a blunt instrument inserted into these cuts and the pieces of plaster pried off.

On the lingual of a full mandible at least two cuts should be made before prying out the pieces. Figure 21.

The flanges should be trimmed off and any rough areas smoothed with sand paper on chuck. Final finishing is accomplished with the usual denture polishing technic.

Figures 22, 23, 24 and 25 show the completed series on the displaced lateral and bicuspid showing the case before operation, incision made and bone removed, crowns removed and roots removed and sutures placed. The wound areas are painted with oil paints to show the bone and tissue surfaces.

ꝏ

The rung of a ladder was never meant to rest upon, but only to hold a man's foot long enough to enable him to put the other somewhat higher.

—Thomas Huxley.

TEACHING DENTISTRY FOR CHILDREN

INTRODUCTION

As the nature of the problem of dental health care has become better understood it has become apparent that more and better dental service must be provided for children. This means, of course, that the schools of dentistry must make certain that their graduates are adequately prepared to render service to children.

Instruction in dentistry for children is not without its problems. Such questions as (1) how it shall be organized and administered in a dental school, (2) what relationships it should have to the instruction given in other fields and departments, (3) where it should be placed in the curriculum, (4) the amount of time to be devoted to it, and (5) the clinical application of the principles and skills are among the questions that have to be answered. Training for such service must, therefore, be a leading feature of the schools.

The series of papers in the following pages deal with some of the main problems in providing undergraduate instruction in dentistry for children. The papers constitute the report of a committee appointed in 1950 by the Committee on Teaching of the American Association of Dental Schools. It is hoped that they will prove helpful to all who are concerned with dental education.

LLOYD E. BLAUCH, Ph.D.,
Chairman, Committee on Teaching,
American Association of Dental Schools.

THE PRESENT STUDY OF THE PROGRAM[1]

KENNETH A. EASLICK, D.D.S.,[2] *Ann Arbor*

The American Association of Dental Schools determined last year to make a study of the subject, "The Teaching of Dentistry for Children." A committee with Dr. Lloyd E. Blauch, U. S. Office of Education, as chairman, was appointed. During a meeting of this committee, June 22-23, 1950, in the Office of Education, Washington, D. C., it was decided to conduct a survey of the present undergraduate teaching of dentistry for children in the Canadian and United States' schools of dentistry, and to prepare a report for this meeting.

It was agreed, further, by the educators, federal service representatives, teachers of orthodontics and teachers of dentistry for children who were

[1]This and the following eight papers were presented at the 1951 meeting of the American Association of Dental Schools at French Lick, Indiana, as a committee report on Teaching Dentistry for Children.
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present that the scope of the present report should be comprehensive. In order to prepare the report, four major areas of impact on the teaching of dentistry for children were to be explored. These four areas, modified somewhat during successive meetings in Atlantic City and Chicago, may now be listed:

I. The Public Aspects of Practice for Children
   A. Public Pressures to Expand Oral Health Care for Children.
   B. Oral Health Needs of Children and Facilities and Plans for Supplying Them.
   C. Recent Research Findings Pertinent to the Practice of Dentistry for Children.
II. The Story of the Development of Instruction in Dentistry for Children.
III. The Current Situation of Instruction in Dentistry for Children. (Survey Findings.)
IV. Recommendation for the Improvement of the Teaching of Dentistry for Children.
   A. Scope and Objectives.
   B. Content of Program.
      1. Basic Studies.
      2. Classroom Course.
      3. Laboratory Course.
      4. Clinical Activities.
   C. Relationship with Orthodontic, Public Health and Other Branches of Dental Instruction.
   D. Desirable Research to be promoted.

Finally, at the Chicago committee meeting in February, the portions of the study to be presented were assembled into a program for the present meeting. This report becomes the sixth of a series of reports sponsored by the Committee on Teaching since it was appointed in 1944. The subjects of the other reports, in review, were (1) Histology; (2) Oral Diagnosis; (3) Radiography; (4) Biochemistry, and (5) Orthodontics. The committee members found the preparation of the sixth report both challenging and intriguing.

PUBLIC INTEREST IN THE EXPANSION OF ORAL HEALTH CARE FOR CHILDREN

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During the week of December 3, 1950, some 5000 people met in Washington, D. C., at the invitation of the President of the United States, to center the nation's attention on the needs of children. This meeting, the fifth of its kind since the turn of the century, was called the Mid-Century White House Conference on Children and Youth. Its focus was "to consider how we can develop in children the mental, emotional, and spiritual qualities essential to individual happiness and to responsible

[1]Children's Bureau, Federal Security Agency, Social Security Administration, Washington 25, D. C.

citizenship, and what physical, economic, and social conditions are deemed necessary to this development."[2]

This focus, centering on the individual child, reflects the dominant theme of our society which has been unfolding for the last 50 years: that the increasing complexity of life in the Twentieth Century has created many problems; that these problems concern individuals, but not apart from their social setting; that society has an obligation toward the individual as well as the individual toward society; and that "man's health, and his lack of it, are social products."[3]

White House conferences, although sponsored by the government, are "grass-roots" movements. They represent the culmination of years of effort by many individuals, community groups, and organizations who are working for the betterment of children. The Mid-Century Conference, for example, represented more than a year's assay of the needs of children by state and local committees in each of the states and territories. Four hundred sixty-four non-governmental organizations, representing health, welfare, education, recreation, religion, made up one of the advisory councils assisting the national committee in planning the conference.

The White House conferences, then, have been citizens' conferences in which local experience for the preceding ten years is pooled and discussed under the prestige of an invitation from the President. The topics of discussion at these conferences have largely been programs that were started in local communities. The success of these local efforts as they became known welled into national movements which many times led to to the passage of legislation aimed to improve services to children. Oral health services have been a part of these programs.

Public interest in expansion of oral health service for children can be summarized in relation to the 5 decades in which White House conferences have been held.

1900-1910

In the early 1900's, child welfare was still largely concerned with handicapped children, the homeless, the neglected, the blind, the mentally defective. Most of child welfare was supported by private philanthropy. Most states had created boards of health by this time but the programs were limited to sanitation and the control of communicable diseases.[4] Over two-third of the states had passed compulsory school attendance laws and were increasing the number of children attending schools[5] but health supervision was receiving little attention except for some medical inspection in a few of the larger city schools.[6]

About 1906, it became apparent that the welfare of children was a legitimate interest of the nation and that federal investigation of the problems of child welfare was indicated. The first Senate bill to establish a children's bureau was introduced in the 59th Congress, January 10, 1906. Continuing interest resulted in President Theodore Roosevelt's invitation to several hundred persons to come to Washington and discuss the care of dependent children. The meetings, held January 25-26, 1909, and attended by men and women from nearly every state in the Union, came to be known as the first White House Conference.

Among the 14 conclusions of this conference was "Every needy child should receive the best medical and surgical attention, and be instructed in health and hygiene."[7] The participants felt, also, the need of accurate information concerning questions relating to childhood and felt that the "National Government not only has the unquestioned right of research in such vital matters, but is the only agency which can effectively conduct such general inquiries as are needed for the benefit of all our citizens."

1910-1920

On April 9, 1912, a children's bureau was created in the federal government. Almost the first act of this bureau was the launching of a study of infant mortality. The findings of this study contributed greatly to the movement to reduce infant mortality which developed into a larger public health movement for the promotion of personal hygiene.[8]

This decade expanded the concern for school health. In 1910 the Oral Hygiene Committee of the National Dental Association announced a plan "for a campaign in which the three greatest educational factors in this country should be used in spreading oral hygiene propaganda—the public school, the public press and the public platform."[9] This campaign opened in Cleveland, March 8, 1910. The use of dental hygienists in public schools was discussed in dental meetings in 1911.[10] They were introduced into the Bridgeport, Connecticut, schools in 1914. By 1911, more than 400 school systems had medical inspection and some 48 city school systems were employing dental staffs.[11] A Joint Committee of Health Problems in Education was established by the National Education Association and the American Medical Association. A report by this committee in 1916, concerning rural school children, showed that teeth defects led the list of health problems. Somewhat optimistically, it predicted that "in the near future adequate dental care will be insured to all school children."[12] In 1918, a commission appointed by the National Education Association considered the objectives of education as a whole. Health was listed as the first of these objectives.[13] Perhaps the most

forceful event of this period was the entrance of the United States into World War I in 1917. The subsequent examinations of young men for military duty produced a health evaluation on a national scale. The fact that defective and deficient teeth was the condition with the highest ratio per 1000 men[14] was widely discussed.

A second White House Conference was called by President Wilson for May and June, 1919, to discuss child welfare standards. A major section of this conference was given to a discussion of the health of children and mothers. The program included a paper on dental clinics and the prevalence of dental caries among children. Dental clinics were included in the minimum standards for the public protection of the health of children and mothers developed by this conference.[15]

1920-1930

Following the second White House Conference, the Sheppard-Towner Act was enacted by the Congress and signed by President Harding November 23, 1921. This authorized an annual appropriation of $1,240,000 as grant-in-aid to the states to promote the welfare and hygiene of maternity and infancy. The Sheppard-Towner Act, the first federal-state cooperative program for improving local services to children, was in force for seven years.

In 1922, the Commonwealth Fund found that, while there was a large variety of efforts to improve the health of children, there was almost no unified concept of child health service, particularly in small towns or country areas. The fund launched a program, in the form of demonstrations, in four areas, toward the "Mobilization of community resources for specific public health objectives and . . . greater scientific knowledge of personal health and greater public interest in its acquisition."[16]

This program is but one instance of the role played by modern foundations in the social movement of the Twentieth Century. Harrison and Andrews show that 364 foundations, interested in the field of social welfare, have been established since 1900; more than half of them before 1930.[17] Such foundations, with capital assets of well over a billion dollars, have generally supported activities which include dentistry for children.

In 1927, a group of interested dentists organized the American Society for the Promotion of Dentistry for Children. This society, which has had a steady growth ever since, was officially changed to the American Society of Dentistry for Children in 1940. The latest report of this society listed a membership of approximately 5000 dentists. In addition to the parent body there are 21 active state units.

This period culminated in a third White House Conference, called by President Hoover, November 19-22, 1930, which resulted in the most comprehensive statement of the needs of children that had probably ever been assembled. Its highlight, widely used since, was a children's charter which included, "For every child health protection from birth through adolescence, including . . . regular dental examinations and care of the teeth. . . ."[18]

1930-1940

Even as this conference began, the country was sinking into a most devastating depression; a depression which indicated that the problem of economic security cannot be met by individual effort alone. On August 14, 1935, the Social Security Act became law; the first nationwide attack on a permanent basis by all levels of government on the problem of economic security.[19] This act reestablished federal grants-in-aid for maternal child and health, along the lines of the Sheppard-Towner legislation, but with broader scope, and, among other grants, authorized those for crippled children and child welfare service. Amendments to this act, passed in 1939, increased the maximums authorized for grants to states for maternal and child health and crippled children, and other amendments in 1946 raised the grant ceilings to 22 million dollars a year for all three programs. The Social Security Act amendments of 1950, passed by the 81st Congress and approved by President Truman, August 28, 1950, authorize a further increase in these grants-in-aid to 41.5 million dollars annually. Although a few states had inaugurated public dental health programs in the 1920's, the marked growth of such activities dates largely from the public health training and positions made available by Social Security funds.

The 1930's might be classified as the decade of investigation. It began with the report of the Committee on the Costs of Medical Care, a group of 45 representing medicine, public health, the social sciences, and the general public. Sickness and medical care were studied and reported in detail. The distribution of dental services in the various elements of the general population was a part of this intensive study.[20] The introduction, in 1939, of the National Health bill by Senator Robert F. Wagner, was one of the results of the interest aroused by this investigation.

In 1933, as a result of a resolution of the American Dental Association, a dental survey of school children, participated in by about 8000 dentists, was made. Twenty-six states were represented in the completed examinations. The tabulation of these oral observations was published in 1936.[21] Some important epidemiological studies of dental disease were made in

the late 1930's, including the famous "Hagerstown" studies of dental needs in children begun in 1937.[22] The relationship of fluoride bearing domestic waters to the prevention of dental caries was also studied and defined during this period.[23]

The fourth of the White House Conferences was called by President Roosevelt for January 18-20, 1940, to consider the theme of "Children in a Democracy." Health was again a major subject of the conference, which concluded that "To bring the health of the children of America up to the level that the present state of scientific knowledge would allow, it is only necessary to close the gaps that yawn between present standards and existing provisions for the protection of health and care in sickness."[24]

1940-1950

World War II and its "cold war" aftermath have dominated the 1940's but intensified the concept of health's social importance. Selective Service reports on the physical condition of young men shocked the nation, and again defective teeth led the list.[25]

The United States Senate Committee on Education and Labor set up a subcommittee on Wartime Health and Education in 1943 which conducted hearings and investigations. This committee agreed on the urgent necessity of preparing a national program of health for the future. Numerous health bills have been introduced into Congress since, among them a bill for health education and dental services sponsored by the American Dental Association.[26]

On November 19, 1945, President Truman sent a message to Congress asking for a national health program. Bills to implement this program have been before the Congress ever since. The latest comprehensive bill, upon which hearings were held but no action taken, was the National Health Insurance and Public Health Act, S. 1679 (H.R. 4312-4313), introduced April 25, 1949.

The introduction of health legislation has been bi-partisan. Senate bill 2143, of 1946, sponsored by three Republican Senators, proposed health functions, among them, grants-in-aid for dental services.[27] There has been a steady expansion of federal support of research and a marked growth of the National Institute of Health. The National Institute of Dental Research was established June 24, 1948. (Public Law 755.)

In May, 1946, the American Academy of Pediatrics (founded in 1930) launched a study of child health services and pediatrics education which eventually reached every county in the United States. The main report of this study, which included dental services for children, was published

by the Commonwealth Fund in 1949. Its masses of data have also been released as state reports in many sections of the country.

Significant, too, are the government reorganization plans, the first by President Roosevelt in 1939, and the second by President Truman in 1946, which have established the Federal Security Agency and transferred to it most of the civil agencies dealing with health, welfare, and education.

In 1947 the 80th Congress established a Commission on Organization of the Executive Branch of the Government, known as the Hoover Commission. (Public Law 162.) Under the chairmanship of Herbert Hoover, this commission made studies of the various government activities and recommended many reorganizations. In examining medical activities they found that four big and some forty smaller agencies of the Government spent about 1250 million dollars for health and medical services in 1948. The commission recommended a "long-range frontal attack upon diseases which impair the health and productivity of the nation"[28] and outlined a United Medical Administration to achieve it.[29] Since this report, there have been various efforts, both by bills in Congress and executive orders, to give health, education, and welfare cabinet status.

The development of topical applications of sodium fluoride as a preventive of dental caries in the 1940's culminated in federal action. The 80th Congress, in July, 1948, appropriated one million dollars to enable the Public Health Service to "set up facilities to work in cooperation with the states, dental societies, and other organizations to demonstrate to the dental profession and the people of America generally the efficacy of the relatively new procedure."[30] These demonstrations were underway in 35 states in 1949 and are still going on.

The 81st Congress (1949-50) was very active in health legislation. The 1950 amendments to the Social Security Act have already been noted. Public Law 692, August 15, 1950, an omnibus research bill, permits the National Institute of Health to expand research in a variety of fields and extend the program for trainees, fellowships, and construction. It also removes the ceilings on appropriations for dental research. Public Law 507, May 10, 1950, created a National Science Foundation, an independent agency of government, to coordinate and integrate research. It can initiate and support research in the mathematical, physical, medical, biological, and other sciences, and grant graduate fellowships.

The Senate of the 81st Congress passed grant-in-aid bills for extensive school health services, local public health services, and comprehensive aid to medical education, which includes dentistry. All of these bills were considered in the House, but no action taken.

In summary, a brief survey has been presented of some of the public

interest in expansion of oral health care for children. There are, no doubt, many other evidences which could be cited; such as the activities of the parent-teacher associations, labor organizations, welfare groups, the American Public Health Association, and the American School Health Association.

These programs appear to have developed as a part of a transition which in 50 years has moved from "poor relief" to the comprehensive welfare of all children; a transition wherein society is assuming more and more responsibility for assuring the individual opportunity for health and well-being; a transition which has developed the conception of health as fundamentally important to social welfare.

One of America's foremost medical educators has pointed out that "Increasingly medicine has focused its attention on man as a social organism," and that the evolution of medical education, "largely reflect the social, industrial, and cultural characteristics of the times."[31]

REFERENCES

[3]Mid-Century White House Conference on Children and Youth: Its Organization and Structure. (Mimeographed.) Federal Security Agency, Washington, D. C.

[5]Bossard, J. H. S.: Social Change and Social Problems; New York, Harper; 1934, *XII*.

[4]Smillie, W. G.: Public Health Administration in the United States, third edition; New York, Macmillan; 1947, XX.

[5]Deffenbaugh, W. S., and Keesecker, W. W.: Compulsory School Attendance Laws and Their Administration; Education Office Bull. No. 4, 1935; Washington, Government Printing Office; 1935, *VII*.

[6]Wood, T. D., and Rowell, H. G.: Health Supervision and Medical Inspection of Schools; Philadelphia, Saunders; 1927.

[7]U. S. Senate: 60th Congress, Document 721. Proceedings of the Conference on the Care of Dependent Children; Washington, Government Printing Office, 1909; Serial set No. 5400.

[8]Winslow, C-E. A.: The Evolution of Public Health and Its Objectives; pp. 19-33. (In Simmons, J. S., ed., Public Health in the World Today; Cambridge, Harvard University Press; 1949, *XVII*.)

[9]Ebersole, W. G.: A Report of the Work Accomplished by the National Dental Association Oral Hygiene Committee; *Dent. Cosmos*, *53*, 333-39; 1911 (Mar.).

[10]Fones, A. C.: The Necessity for and Training of a Prophylactic Assistant; *Dent. Cosmos*, *54*, 284-9; 1912 (Mar.).

[11]Ayres, L. P.: The New Attitude of the School Toward the Health of the Child; Russell Sage Foundation, Bull. No. 96, 1911.

[12]Wood, T. D.: Minimum Health Requirements for Rural Schools; Chicago, American Medical Association, 1916.

[13]National Education Association of the United States: Bull. No. 35, Cardinal Principles of Secondary Education; Washington, Government Printing Office, 1918.

[14]Love, A. G., and Davenport, C. B.: Defects Found in Drafted Men; Washington, Government Printing Office, 1920. (Military Affairs Committee, Senate Committee print., 66th Cong., 1st session.)

[15]Chenery, W. L., ed.: Standards of Child Welfare; Conference Series No. 1, Children's Bureau publication No. 60, Washington, United States Children's Bureau, 1919.

[16]Dinwiddie, Courtenay: Child Health and the Community; New York, Commonwealth Fund, 1931.

[17]Harrison, S. M., and Andrews, F. E.: American Foundations for Social Welfare; New York, Russell Sage Foundation, 1946.

[18]White House Conference, 1930; New York, Century Co., 1931.

[19]Ross, Mary: Social Security in the United States; Federal Security Agency, Washington, Government Printing Office, 1948.

[20]Collins, S. D.: Frequency of Dental Services Among 9,000 Families, Based on Nationwide Periodic Canvasses, 1928-31; Pub. Health Rep., *54*, 629-57; April 21, 1939.

[21]Messner, C. T., et al.: Dental Survey of School Children, Ages 6-14 Years, Made in 1933-34 in 26 States; Public Health Bull. No. 226, Washington, Government Printing Office, 1936.
[22]Klein, Henry: The Epidemiology of Dental Diseases; collected papers, 1937-947; Washington, Public Health Service, 1949.
[23]McKay, F. S., et al.: Fluorine in Dental Public Health: A Symposium; New York, New York Institute of Clinical Oral Pathology, Inc., 1945.
[24]White House Conference on Children in a Democracy; Jan. 18-20, 1940 (final report); Washington, Government Printing Office, 1940, XXII.
[25]National Headquarters, Selective Service System: Periodic Reports of Physical Examinations; Vol. 3, Nov. 1940-Sept., 1945, Army Medical Library, Washington, D. C.
[26]United States Congress (79th, 1st session), H. R. 3412. Mr. Brehm, June 7, 1945; Washington, Government Printing Office, 1945.
[27]United States Congress (79th, 2d session), S. 2143. Mr. Taft, Mr. Smith and Mr. Ball, May 3, 1946; Washington, Government Printing Office, 1946.
[28]Commission on Organization of the Executive Branch of the Government Task Force Report on Federal Medical Services, Jan., 1949; Washington, Government Printing Office, 1949.
[29]Commission on Organization of the Executive Branch of the Government. Reorganization of Federal Medical Activities. A report to Congress, Mar., 1949; Washington, Government Printing Office, 1949.
[30]United States Congress (80th, 2d session): The Supplemental Federal Security Agency appropriation bill, fiscal year 1949 (H.R. 6355, April 27, 1948). Washington, Government Printing Office, 1949.
[31]Allen, R. B.: Medical Education and the Changing Order; New York, Commonwealth Fund, 1946.

ORAL HEALTH NEEDS OF CHILDREN: PERSONNEL, FACILITIES AND PLANS FOR SUPPLYING THOSE NEEDS

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Oral Health Needs

Of all the health service needs of the children of this country, the most universal are those caused by a wide range of dental defects or abnormal oral conditions. These conditions may be due to abnormal growth and development or they may be caused by diseases of, or injuries to the teeth, their supporting, and associated structures. In general, the conditions fall into the following broad categories:

1. Diseases of and injuries to the teeth such as dental caries, erosion, fractures, and/or abrasions;

2. Abnormal growth and development of the jaws and associated structures, which would include abnormal relationships of the teeth and jaws of genetic or environmental origin, those malrelationships produced by abnormal function, and such congenital deformities as cleft palate, cleft lip, missing teeth, and supernumerary teeth;

3. Diseases of the supporting structures of the teeth, such as acute and chronic infections of the periodontal tissues, oral cancer, and pathological or abnormal conditions which reflect general systemic abnormalities due to malnutrition, blood dyscrasias, and diabetes;

4. Traumatic injuries of the jaws and related structures;

5. Malformations of the teeth caused by congenital syphilis, infantile

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tetany, febrile diseases of childhood, endemic fluorosis, malnourishment, and disturbances of the endocrine system, including hypoplasias of enamel, abnormal or incomplete tooth formation, such as peg laterals, Hutchinson's teeth, and congenitally missing teeth ranging from partial to complete anodontia.

Some of the diseases or abnormal conditions which give rise to dental needs are much more prevalent than others. Dental caries is one of the most prevalent of all diseases. In some areas more than 50 per cent of two-year-old children have one or more carious primary teeth.[2] And at age seven the average number of carious primary teeth per child may be as high as seven or eight.

In general, the permanent teeth begin to erupt when the child is about six years old. From that time on they are attacked by dental caries at a fairly constant incidence rate. At age fifteen, five to nine teeth have been attacked, and more than 90 per cent of children have had caries experience in their permanent teeth. These prevalence rates of dental caries are based on the results of a limited number of studies conducted in different sections of the country. There is evidence that the rates vary widely from one geographic area to another; that they are influenced by race, by local habits of eating, by the amount of fluoride in the drinking water, and by other undetermined factors. Although our knowledge of the exact prevalence of dental caries is somewhat limited, it is clear that the condition is extremely common and constitutes a major hazard to dental health.

It is apparent that malocclusion and related malformations have, to a great extent, a genetic source, and that with the ever-increasing mixing of different racial stocks these abnormalities are increasing in prevalence.[3] Estimates of the prevalence of malocclusion among children range from 15 to 52 per cent.[4,5,6] More exact information on the prevalence of malocclusion will become available when present attempts to develop a uniform system of examination and classification have been successful. Another important developmental defect is cleft palate, a condition present in roughly one out of every 800 live births.[7]

Dental caries and malocclusion are the most common of the diseases and conditions which give rise to the need for dental health services for children. However, acute infections of the soft tissues of the mouth, the less common aberrations in development and growth, and the not uncommon injuries to dental structures and supporting tissues represent conditions for which the average dentist may be expected to render service at irregular intervals.[3,8,9]

Personnel

Pedodontists or specialists in dental services for children are recognized in this country. However, evidence from the 1950 Directory of the American Dental Association indicates that there are less than 100 such specialists. It becomes obvious, therefore, that the general dental practitioner must include dental services for children in his practice if the needs for this group are to receive attention. There are now 84,000 dentists. Ninety-five per cent of them, according to the report of the American Academy of Pediatrics,[10] render services for children. The same report states that 25 per cent of the patients of these dentists are children. This per cent represents a close approximation of the ratio of children to total population. But it cannot be assumed that dentists are devoting the same proportion of their hours of total service to children. All evidence available indicates that there is a wide disparity between the dental needs of children and the services rendered.[4,11,12,13,14,15,16,17] It appears that not more than 30 per cent of children are getting what might be considered regular dental care services.

Facilities for Rendering Dental Services to Children

Since only one child in 50 receives dental care in a public clinic,[18] facilities for rendering such care are almost solely provided by the private practitioner in his office. As the geographic distribution of dentists is closely related to per capita income, there are great differences between states in the availability of dental care facilities for children.

For example, the number of persons per dentist in New York state is 1063 and in California 1405. Whereas, in low income states, such as Mississippi and South Carolina, there are 4387 and 4995 persons per dentist, respectively.[19]

Only recently have dental schools offered what might be considered adequate training and orientation in problems related to the practice of dentistry for children. As almost half of the dentists in the country are over 45 years old, it is obvious that the majority of them have not been trained in dentistry for children. Furthermore, only 9 per cent of them have been exposed to modern post-graduate courses in subjects relating to services for children. Of this number one-third have less than one month of training.[10] Thus, the problem of personnel for rendering health services for children involves an increase in the number of dentists, improvement in their geographic distribution, provisions for continuing education in professional technics, and the application of measures for making their services more readily available.

Plans for Increasing the Supply of Oral Health Services for Children

As might be expected in the face of a wide disparity between dental needs and dental services available to supply those needs, a great variety of plans have been proposed for closing the gap.

By and large there is broad general agreement that optimum dental health services for children can be rendered only if regular periodic dental examinations are made, and if needs are met as they arise. Through this method of rendering services the present backlog of accumulated dental defects would be eliminated gradually and the complications due to neglect would be avoided.[20]

One of the specific plans for obtaining the manpower necessary to implement this proposal recommends that it be done by increasing the number of dentists. Other plans propose that the usefulness of dentists now available be increased through more effective utilization of dental equipment and through the efficient use of auxiliary personnel, such as dental hygienists, dental assistants, and dental technicians.[21] Although the evidence supporting this approach is not conclusive, it suggests that the services rendered by one dentist might be doubled or trebled through appropriate use of auxiliary personnel, and that the efficient use of such personnel would tend to increase rather than decrease the quality of services rendered.

Another plan recommends that dentists organize group practices and that the amount of work done by each member of the group be increased through the efficient fractionation of mechanical procedures.[22]

Of these several plans, two appear to have rather broad acceptance by the dental profession. These proposals provide for a gradual increase in the number of dentists and for a marked increase in the utilization of auxiliary personnel by these dentists. The efficient use of auxiliary personnel may require that dental students receive special training and experience in the proper utilization of such personnel.

Dental defects due to caries occur almost universally in children and should be treated at relatively frequent and periodic intervals. It is becoming increasingly apparent that dental services for children must be made readily accessible if they are to be effectively utilized. Here again the proposals vary widely, ranging from the provision of services in child collection centers, such as schools, to the location of more private dental offices in suburban areas rather than in metropolitan sections of cities and towns.

At this time it is difficult to say which of these many plans will be

adopted and carried out. The principal argument against some of the proposals is based on the fear that high quality services by well-trained dentists will not be maintained for children. It would, therefore, appear imperative that every dental school provide its students with a thorough background in the biological sciences, adequate clinical training in dentistry for children including the use of auxiliary personnel, and opportunities for providing continuing education in this important field.[28]

REFERENCES

[3]McCall, J. O.: Annual Report, 1939; The Murry and Leonie Guggenheim Dental Clinic, New York City, New York.

[5]Easlick, Kenneth A.: Oral Health Services During the Period of the Primary Dentition; Proceedings of the 24th Annual Meeting; 24, 189-196, American Association of Dental Schools.

[4]Messner, C. T., Gafafer, W. M., Cady, F. C., and Dean, H. T.: Dental Survey of School Children, Ages 6-14 Years, Made in 1933-34 in 26 States; Pub. Health Bull. 226, May, 1936.

[5]Brucker, Marcu: Studies on the Incidence and Cause of Dental Defects in Children, IV. Malocclusion; *Journal of Dental Research*, 22, 315-321; 1943 (Aug.).

[6]Brandhorst, O. W.: Will Orthodontics Become a Part of Contemplated Government Health Programs for Children? *J. Dent. Education*, 10, 138-142; 1946 (Feb.).

[7]Grace, L. G.: Frequency of Occurrence of Cleft Palates and Harelips; *J. Dent. Res.* 22, 495-497; 1943 (Dec.).

[8]Martin, Ruth: Oral Health Services During the Period of the Permanent Dentition; Proceedings of the 24th Annual Meeting, 24, 196-199; American Association of Dental Schools.

[9]Gerrie, Norman F.: Standards of Dental Care in Public Health Programs for Children; *Am. J.P.H.*, 37, 1317-1321; 1947 (Oct.).

[10]Child Health Services and Pediatric Education and Supplement to Child Health Services and Pediatric Education. Reports of the Committee for the Study of Child Health Services. The American Academy of Pediatrics with the cooperation of the United States Public Health Service and the United States Children's Bureau. New York, The Commonwealth Fund, 1949.

[11]Knutson, John W., Klein, Henry, and Palmer, Carroll E.: The Dental Needs of Grade School Children of Hagerstown, Maryland; *J.A.D.A.*, 27, 579-588; 1940 (Apr.)

[12]Britton, R. H., and Perrott, G. St. J.: Causes of Physical Disqualification Under Selective Service Law. Early Indications; *Pub. Health Rep.*, 56, 1017-1021; May 9, 1941.

[13]Klein, Henry, and Palmer, C. E.: Disparity Between Dental Need and Dental Care in School Children in Hagerstown, Maryland, Maryland Environs; *J.A.D.A.*, 28, 1489-1498; 1941 (Sept.).

[14]Klein, Henry: Tooth Mortality and Socio-Economic Status—Life Tables for Teeth; *J.A.D.A.*, 30, 80-95; Jan. 1, 1943.

[15]Knutson, John W.: An Index of the Prevalence of Dental Caries in School Children; *Pub. Health Rep.*, 59, 253-263; Feb. 25, 1944.

[16]Treolar, Alan E.: A Survey of Needs and Services Available for Protective Dentistry for the Indigent Children and Youth in the U.S.A.; *J.A.D.A.*, 31, 326-334; 1944 (Mar.).

[17]Easlick, K. A.: Dental Caries; C. V. Mosby Co., St. Louis, 1948.

[18]Fulton, John T.: The Role of Dental Clinics in Control of Caries; *J.A.D.A.*, 37, 438-443; 1948 (Oct.).

[19]Distribution of Dentists in the United States, 1950; A.D.A. Bureau of Economic Research and Statistics.

[20]Knutson, John W.: Appraising the Dental Health Program; *J.A.D.A.*, 29, 543-566; 1942 (Apr.).

[21]Blackerby, P. E., and Clawson, M. Don: Auxiliary Personnel—How Far Should We Go? *New England Dent. J.*, 1, 7-13; 1948 (July).

[22]Hyser, Charles L.: A Proposal for Group Practice in Dentistry; *J.A.D.A.*, 32, 853-859; July 1, 1945.

[23]O'Rourke, John T.: The Need for Re-evaluation of the Dental Curriculum; The Third Congress on Dental Education and Licensure, 1947. American Dental Association, pages 11-29.

RESEARCH IN DENTISTRY FOR CHILDREN

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From the standpoint of its public aspects, the most important role to be played by the dentist in his practice for children is that of prevention of oral disease. Thus, the prevention of dental caries becomes paramount and research findings regarding the control and treatment of this disease entity deserve major consideration.

Although many technics have been proposed, at the present time there are only two generally accepted methods for the control of dental caries in children, the use of diets with low fermentable carbohydrate content, and the use of fluoride solutions. In the case of the first method there have been few, if any, "recent research findings" which change the picture of ten or more years ago.[3] However, the practical application of low carbohydrate diets depends to a great extent on the proper diagnosis of an individual's caries activity rate at a specific time. In this regard, many recent findings are pertinent. The technics and materials for determining caries activity have been considerably improved and are still under study both in terms of their accuracy and their adaptability.[4]

Most of these methods are dependent upon a determination of the number of aciduric organisms present in the mouth or depend on the determination of the acid-producing potential of the saliva. At the present time, this diagnostic type of service is made available to dentists either through state health department laboratories or other institutional laboratories. Many dentists are also using these technics for purposes of "evaluating" their patients in terms of caries susceptibility. This latter use is of particular interest in the field of dentistry for children.

The second method of caries control, i.e., the use of fluoride solutions, stems from the results of recent studies. During the past decade, it has been adequately demonstrated by scientific studies that dental caries can be controlled to a significant degree by the proper use of fluoride solutions topically applied.[5] A practical and efficient technic has been worked out which is adaptable to the dental office or for community dental health programs. Every dentist practicing for children should be thoroughly versed on the use of fluoride solutions and should follow carefully the research studies designed to improve their efficiency. While the effective procedures for fluoride applications as demonstrated to date are relatively simple to follow, some of the details involved have been shown to be of

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major importance in terms of final results. Unfortunately these facts are too often overlooked.

During the past decade, a technic for caries control was proposed based on the theory that the organic constituents of the enamel serve as "invasion roads" for the caries process.[6] The procedure as finally suggested was essentially an impregnation of the tooth substance with a solution of zinc chloride followed by potassium ferrocyanide.[7] Extensive claims were made concerning the success of this method; however, the results of recent scientifically controlled experiments indicate that the procedure has little if any value in caries control.[8,9]

Although the results of studies regarding the effects of water fluoridation may not be directly a concern of those practicing dentistry for children, they do have an indirect bearing. The preliminary findings to date are very impressive; all studies show a trend toward a beneficial effect. The dental profession, and especially those individuals whose practices include a high ratio of children, should keep abreast of the results of investigations in this field. Current information is essential if these individuals are to assume their proper community responsibilities and, also, if they plan to make such adjustments in their practice as may become necessary. Since approval of water fluoridation is a matter of record, the dentist should assume a special responsibility as professional advisor to his community and practice.

For many years, the generally accepted concept regarding the etiology of dental caries has been based on the chemico-parasitic theory advanced by Miller.[10] During the past decade or so certain research studies have produced factual evidence supporting this theory. For example, it has been demonstrated that acids are produced in localized areas on the tooth surface both in carious lesions as well as the susceptible areas. It has also been shown that this acid production is a very rapid phenomenon following the ingestion of readily fermentable carbohydrates.[11] These results have led to increased activity in the field of control measures based on the use of dentifrices or mouthwashes to prevent the production of these acids. The approach is not new and in the past most attempts have not been successful. The more recent investigations, however, are taking advantage of our increased knowledge concerning acid production as previously mentioned. Certain of these studies present evidence suggesting that the immediate brushing of the teeth, after eating, regardless of the type of dentifrice, will produce beneficial effects.[12] Other studies have been given promising results by the use of antibiotic or antienzymatic substances incorporated in dentifrices.

Certain laboratory investigations have suggested that antienzymatic or

antiacid substances could be introduced into the mouth and remain there long enough to change the dental caries process.[13] The clinical trials of incorporating such substances in dentifrices for the control of caries have not as yet proved practical.[14] The incorporation of an antibiotic substance, namely, penicillin, in a dentifrice did show a significant reduction in the dental caries incidence in school children.[15] However, the use of antibiotics, such as penicillin for the control of dental caries does involve theoretical hazards.

Unfortunately, the commercial aspects of these control procedures have led the public to expect more than is forthcoming. But, in spite of the preliminary nature of the data presented in regard to effectiveness for caries control, there is one finding that seems pertinent. It has been demonstrated that the effective control of dental caries by these methods depends to a great extent on the careful supervision of their use. As daily routine procedures, they may be effective on only a small select group of our population; however, such procedures are still to be evaluated both from the standpoint of their practical value and from the standpoint of their contribution to our knowledge of the etiology of caries.

There has been some activity in the field of research dealing with the various treatment procedures used in the practice of dentistry for children. One of the most important developments along this line has been in the treatment of primary teeth exhibiting exposed pulps and young permanent teeth which have suffered severe fracture. Treatment procedures have been developed based on sound scientific observations, whereby many of these teeth, previously lost by extraction, can now be preserved.[16,17,18]

There has also been considerable research activity in the field of pulp tissue reactions to the various filling materials and especially to those substances used for cavity linings.[19,20,21] This work is of special importance to the dentist practicing for children since it will aid him in the selection of those materials which produce the least irritation to the pulp tissues.

The development of the "air-dent" apparatus for the preparation of cavities has attracted considerable attention recently. How it may influence the practice of dentistry for children is still to be determined. Also, the results of studies designed to improve restorative materials, such as the development of the resinous filling materials, have been promising. At present it is too early to evaluate their significance.

Recommendations for Research to Be Prosecuted

In recent years individuals trained in the disciplines of psychology have undertaken the study of those problems involved in the treatment of children. The role of the radio and television in a modern dental office has been studied but not yet evaluated, and many reports dealing with the psychosomatic aspects of the practice of dentistry have appeared. The fact that this "awareness" to the problem has been created is not to be underestimated. It is encouraging to note that in at least some clinical centers the psychologist, speech therapist, dental technician and dental specialist are brought together to solve the problems involved in cleft lip and cleft palate cases. The future in this entire field of endeavor looks encouraging.

In addition to the investigations on dental caries and its treatment, studies on growth and development have produced data in recent years which are of paramount importance. At the present time dentists are reaping the benefits of studies which necessarily were begun almost two decades ago. These investigations are establishing patterns of growth which are giving a scientific basis for many of the newer orthodontic procedures.[22] Dentists are gradually learning more about the genetic or hereditary influences which are so pertinent to the study of malocclusions. Many of these data have suggested methods of treatment which are more efficient and less expensive than those presently used.[23,24] Studies still in progress in Europe have indicated the possibility of orthodontic procedures which would be much more practical from a public health standpoint. These projects deserve special scrutiny by the dentist interested in his children's practice.

There are not enough orthodontists to treat all cases of malocclusion; thus the need is great for earlier diagnosis and preventive measures. In children's dentistry, earlier observations of the potential malalignment of teeth is possible. A large, well-controlled study can offer new clues of etiology and more effective treatment.

The study of dental materials, their properties and clinical uses should be continued. The Bureau of Standards has done excellent work on the physical properties of dental materials. Their work should be continued and greater emphasis placed on new materials and clinical manipulation, especially in terms of children's dentistry.

Another neglected field in dentistry is diagnosis. Research must be directed toward earlier diagnosis of conditions such as suspectibility to periodontal disease. Much of the work accomplished in periodontal diseases has been in adults; however, the years of childhood may be a

better period for the study of this disease, since its etiology may be more obvious and more easily investigated.

Studies on the management of such cases as cleft palates, speech abnormalities, cerebral palsy, retarded patients and crippled children would be profitable in the field of dentistry for children.

While considerable advance in dental research has been made during recent years, the future holds forth greater promise. In the past two or three years, increased funds have been made available directly to the National Institute of Dental Research and to promising individuals in dental schools and research institutions in the form of research grants-in-aid. It is too early to evaluate the effect of this increased research activity on the improvement of the dental health of children in these United States.

In our efforts to train better dentists and instructors, the search for new knowledge must not cease. Only through constant research can children's dentistry progress and provide better service for children.

REFERENCES

[3]Becks, H., Jensen, A. L., and Millarr, C. B.: Rampant Dental Caries: Prevention and Prognosis; *J. Am. Dent. Assn.*, *31*, 1189; 1944 (Sept.).

[4]Jay, P.: Laboratory Tests for Caries Activities and Their Application (in, Dentistry in Public Health); ed., Walter J. Pelton and Jacob M. Wisan, pub., W. B. Saunders Company, Philadelphia, 1949.

[5]Knutson, John W., and Scholz, Grace C.: The Effect of Topically Applied Fluorides on Dental Caries Experience. VII. Consolidated Findings for Four Study Groups; *Pub. Health Rep.*, *64*, 1403; Nov. 11, 1949.

[6]Gottlieb, B.: Dental Caries; Ed. Lea and Febiger, Philadelphia, 1947.

[7]Gottlieb, B.: Technique of Impregnation for Caries Prophylaxis; *Texas Dental Jour.*, *66*, 20; 1948.

[8]Ast, David B.: A Clinical Study of Caries Prophylaxis with Zinc Chloride and Potassium Ferrocyanide; *J. Am. Dent. Assn.*, *41*, 437; 1950 (Oct.).

[9]Pelton, W. J.: The Effect of Zinc Chloride and Potassium Ferrocyanide as a Caries Prophylaxis; *J. Dent. Res.*, *29*, 756; 1950 (Dec.).

[10]Miller, W. D.: The Micro-organisms of the Human Mouth; S. S. White Dental Mfg. Co., Philadelphia, 1890.

[11]Stephan, R. M.: Intra-oral Hydrogen-ion Concentrations Associated with Dental Caries Activity; *J. Dent. Res.*, *23*, 257; 1944 (Aug.).

[12]Fosdick, L. S.: The Reduction of the Incidence of Dental Caries. I. Immediate Tooth-brushing with a Neutral Dentifrice; *J. Am. Dent. Assn.*, *40*, 133; 1950 (Feb.).

[13]Kesel, R. G., O'Donnell, J. F., Kirch, E. R., and Wach, E. C.: The Biological Production and Therapeutic Use of Ammonia in the Oral Cavity in Relation to Dental Caries Prevention; *J. Am. Dent. Assn.*, *33*, 695; 1946 (June).

[14]Research—Study Shows Ammonium Dentifrice Reduces Caries; *J. Am. Dent. Assn.*, *41*, 482; 1950 (Oct.).

[15]Zander, H. A.: Effect of a Penicillin Dentifrice on Caries Incidence in School Children; *J. Am. Dent. Assn.*, *40*, 569; 1950 (May).

[16]Zander, H. A.: Reaction of Pulp to Calcium Hydroxide; *J. Dent. Res.*, *18*, 373; 1939.

[17]Easlick, K. A.: Management of Pulp Exposures in Mixed Dentition; *J. Am. Dent. Assn.*, *30*, 178; 1943 (Feb.).

[18]Hartsook, J. T.: Management of Young Anterior Teeth Which Have Been Involved in Accidents; *J. Am. Dent. Assn.*, *37*, 554; 1948 (Nov.).

[19]Zander, H. A., Glenn, J. F., and Nelson, C. A.: Pulp Protection in Restorative Dentistry; *J. Am. Dent. Assn.*, *41*, 563; 1950 (Nov.).

[20]Zander, H. A., and Pejko, Irene: Protection of the Pulp Under Silicate Cements with Cavity Varnishes and Cement Linings; *J. Am. Dent. Assn.*, *34*, 811; 1947 (June).

[31]Zander, H. A.: The Reaction of Dental Pulps to Silicate Cements; *J. Am. Dent. Assn.*, 33, 1233; 1946 (Oct.).

[32]Hughes, B. O.: Heredity and Variation in the Dentofacial Complex; *Am. Assn. Orthodont. Jr.*, page 92; 1944.

[33]Moore, G. R.: Heredity as a Guide in Dentofacial Orthopedics; *Am. Assn. Orthodont. Jr.*, page 97; 1944.

[34]Brodie, A. G.: Does Scientific Investigation Support the Extraction of Teeth in Orthodontic Therapy? *Am. Assn. Orthodont. Jr.*, page 61; 1944.

THE DEVELOPMENT OF A PATTERN OF INSTRUCTION

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Dentistry for children for many years prior to World War II occupied a subordinate place in the dental school curriculum. In some instances, it was included in the program of the Department of Operative Dentistry, while in others it was absorbed in one or more departments, generally as an unwanted and unasked for stepchild. Few schools assumed leadership in this area of teaching.

Curriculum Prior to 1941

Less than thirty years ago, C. N. Johnson, in his textbook on operative dentistry wrote, "The materials for filling deciduous teeth are limited to those easy of insertion and not too exacting in their requirements," and, "The problem is greatly complicated where two cavities face each other, and in some instances the surest method of making the teeth serviceable for mastication is to bridge across the interproximal space from cavity to cavity with gutta percha." He continues by stating that one may place a metal guard of gold, platinum, or German silver across the interproximal space allowing the ends to rest on the gingival walls of the cavity and building gutta-percha over it.[2]

Conzett and Volland in a chapter of another prominent textbook on operative dentistry, written in 1926,[3] stated that one should use the bur very sparingly for the reason that children dread such, and because a bur in a deciduous tooth is dangerous in that the pulp is very close to the surface. They continued by saying, "The cavity preparation should be nearly all made with hand instruments, and inasmuch as we are not expecting the filling to endure for a long time, sufficient retention can be obtained for all practical purposes."

These leaders in American operative dentistry just cited set the standards for thousands of the leading practitioners, and accordingly determined the type and extent of dental treatment rendered to their

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Paper read before American Association of Dental Schools Meeting, French Lick, Indiana, 1951.

child patients. Even today, a large percentage of the practitioners trained during this period are guided by the teachings while they were in school. It is not the intent to condemn or criticize the leadership during this period, but merely to point out and relate the place pedodontics occupied in the curriculum and practice so few years ago.

The Gies report, submitted to the Carnegie Foundation for the Advancement of Teaching in 1926, referring to the various influences on the processes of a normal dentition, makes one realize how far dentistry has progressed during the past quarter century in its attainment of factual material.[4] Gies recognized this subject only in a general way.

Some years later, in 1935, pedodontics still was an orphan, and the leadership in dental education, with few exceptions, did not deem it advisable to give this subject prominence in the curriculum. The Curriculum Survey Committee of the American Association of Dental Schools in their report, A Course of Study in Dentistry, stated:[5]

"The outline in oral anatomy includes special consideration of deciduous teeth and the eruption of teeth. The instruction in Histology and Embryology deals with deciduous teeth and with the principles of growth and development as applied to oral structures. The suggested courses in personal and mouth hygiene, nutrition, and the application of preventive principles in dentistry emphasize at various points the importance and nature of proper dental service for children, and this phase of dentistry receives further attention in the courses in Operative Dentistry, Dental Prosthesis, Practice Management, and Clinical Dentistry. The outline of Orthodontics, which subject is largely concerned with dental services for children, suggests a course that is considerably more comprehensive than is taught in dental schools at present with possibly very few exceptions. A special clinic is suggested for dental service for children. It would appear, therefore, that dentistry for children receives adaquate attention in the suggested program of instruction."

While excellent instruction no doubt was given in oral anatomy, histology, embryology, operative dentistry, prosthetic dentistry, and other areas as they relate to the child, the information needed to be correlated and applied to clinical cases. Complete mouth analyses and long-range treatment programs had to be taught.

Ireland, reporting on various surveys, indicates that only seven schools offered lectures in pedodontics in 1928, 29 schools in 1932, 38 schools in 1935, and 42 schools in 1936.[6]

In October, 1941, at the meeting of the American Dental Association in Houston, the Council on Dental Education included the subject of dentistry for children in the curriculum as one they (the council) would expect to find in an approved school.

Minimum Requirements Suggested in 1942

The American Society of Dentistry for Children, through its College

Committee, submitted the following minimum requirements for an undergraduate program:[7] (a) one instructor with the status of a director of a separate division; (b) a separate lecture course of at least 16 hours; (c) special equipment for the clinical procedures; (d) if facilities permit, the use of a children's hospital as a teaching unit, and (e) a minimum of 90 to 100 hours of clinical operating time.

Factors Effecting the Development of the Curriculum

Organization of Pedodontic Societies and Specialty Board: One of the greatest motivating forces in gaining support for pedodontics within the profession has been the American Society of Dentistry for Children, first organized in 1927. This society, with a membership of over 4200, must be given the major credit for popularizing dentistry for children in the general practictioner's office and in most schools of dentistry. Today, too, there are the American Academy of Pedodontics, the membership of which is restricted to those who limit their interest primarily to pedodontics, and the American Board of Pedodontics, which has been given authority by the Council on Dental Education to certify certain individuals who meet given requirements in the field of pedodontics. The curriculum for graduate and postgraduate work in pedodontics is influenced to a great extent by the requirements and recommendations set forth by the American Board.

Graduate and Postgraduate Instruction: Graduate and postgraduate instruction, now offered by a number of schools, will assist materially in supplying the demand for undergraduate teachers in pedodontics, and further, will improve the undergraduate curriculum by stimulation from this level of training. The development of graduate instruction also has assisted in presenting a specialized area of knowledge, defining the field of content in technic and practice.

Social Pressures: The various state, county, and city departments of health have been an effective force in molding public and professional opinion regarding the needs of dentistry for children. Federal agencies such as the United States Public Health Service and the Children's Bureau, too, have contributed much in making available personnel, money, and materials for programs directed to the profession and to the public. Parent-teacher organizations, civic clubs, and legislative bodies have been motivated into action, and such social pressures still are gaining momentum.

Research in Related Fields: Research in various areas related to growth and development of the face, arches and teeth, in orthodontics, anthro-

pology, histology, and pediatrics, and to nutrition and metabolism have had a marked influence on the subject of dentistry for children in the curriculum. Orthodontics, particularly through its research and literature, has been instrumental in developing a pattern of instruction in pedodontics.

Studies and research in the psychological development of the child, too, have been most helpful in approaching the problems related to practice for children.

Development of Literature in the Field: The first book, directed primarily to dentistry for children, was published in 1924,[8] while the second one by another author was published in 1925.[9] A third author released his first book in 1932,[10] and a fourth in 1937.[11]

It is interesting to note the importance given specifically to pedodontics in two of the most recent textbooks on operative dentistry, namely, about 10 per cent of the total pages in one[12] and only 2.5 per cent in the other.[13] Some of the procedures and technics submitted for the permanent teeth are, of course, equally as applicable for the primary dentition.

The American Society of Dentistry for Children (formerly called The American Society for the Promotion of Dentistry for Children) first published its "Review of Dentistry for Children" in November, 1933. This quarterly publication, now called the "Journal of Dentistry for Children," currently is listed as volume XVIII, 1951.

While all the national and state dental journals carried articles pertaining to pedodontics at intervals, the primary publications other than the "Journal of Dentistry for Children," which featured this subject, were: the "International Journal of Orthodontia" and the "American Journal of Orthodontics."

A review of the literature, during the past quarter of the century, will reveal a considerable number of significant advancements relating to the practice for children in such areas as: child and parent management, diagnostic technics and considerations, pulp management, preventive technics, morphology of the teeth, occlusion and economics. There are others.

Instruction in Pedodontics: 1950 Survey

Forty-three schools responded to question I of the questionnaire sent to the dental schools of the United States and Canada during September of 1950, by the Commitee on Instruction in Dentistry for Children of the American Association of Dental Schools. The question read: "Please give a brief historical sketch of the program of instruction in dentistry for children in your school, with particular reference to changes in

policy and objectives." The data, as submitted, have been consolidated as follows:

I. Initiation of Course in Pedodontics
   A. Two schools (Marquette and Northwestern Universities) first presented courses in 1921
   B. Six schools began instruction 1924-1929
   C. Thirteen schools began instruction 1930-1939
   D. Remaining schools began instruction 1940-1950.

II. Departmental Status for Pedodontics
   A. Northwestern University was first to give departmental status to pedodontics in 1921
   B. Three other schools recognized pedodontics by giving departmental status 1924-1929 (Iowa, Tennessee, and Columbia).

III. General Comments: In general, the statements submitted by the schools indicated a progressively greater interest in pedodontics didactically and clinically during the past 10 years. However, less than half of the schools reporting have adapted the minimum requirements recommended by the American Society of Dentistry for Children in 1942.

Summary and Conclusions

1. Dentistry for children prior to World War II occupied a subordinate place in the dental school curriculum.

2. Council on Dental Education in October, 1941, included the subject of dentistry for children in the curriculum of an approved school.

3. The American Board of Pedodontics, in establishing its standards and requirements, has assisted materially in the development of a pattern of graduate instruction in pedodontics.

4. The development of graduate instruction in pedodontics has aided in defining the field of content in technic and practice.

5. Social pressures, research in related fields, and the development of literature in this area have had a marked influence on the curriculum as it pertains to pedodontics.

6. Less than half of the schools reporting have adopted the minimum requirements recommended by the American Society of Dentistry for Children in 1942.

References

[3]Johnson, C. N.: A Textbook of Operative Dentistry, 4th edition; Philadelphia, P. Blakiston's, 1923; xvi plus 1136 p.

[4]Conzett, J. V., and Volland, R. H.: Instrumentation, Cavity Preparation and the Filling of Teeth with Gold Foil, Gold Inlays, Amalgam Cements and Gutta-Percha; pages 291-406. (In Ward, M. L., ed., The American Textbook of Operative Dentistry; 6th ed., Philadelphia, Lea & Febiger, 1926; xiv plus 818 pages.

[4]Gies, W. J.: Dental Education in the United States and Canada; a Report to the Carnegie Foundation for the Advancement of Science. New York, Carnegie Foundation for the Advancement of Teaching, 1926; xxi plus 692 pages.

[5]American Association of Dental Schools Curriculum Survey Committee: A Course of Study in Dentistry; Chicago, American Association of Dental Schools, 1935; xiii plus 412 pages.

[6]Ireland, R. L.: Undergraduate Courses in Dentistry for Children; *J. Dent. Child.*, *14*, 25-7; 1947.

[7]American Society of Dentistry for Children, College Committee. Report. Part I: The Undergraduate Program in Dentistry for Children. *J. Dent. Child.*, *9*, 50-5; 1942.

[8]Hogeboom, F. E.: Practical Pedodontia or Juvenile Operative Dentistry and Public Health Dentistry; 1st ed.; St. Louis, The C. V. Mosby Co., 1924; 100 pages.

[9]Jordan, M. E.: Operative Dentistry for Children; 1st ed.; Brooklyn, Dental Items of Interest Publishing Co., 1925; xii plus 182 pages.

[10]McBride, W. C.: Juvenile Dentistry; 1st ed.; Philadelphia, Lea & Febiger, 1932; vi plus 182 pages.

[11]Brauer, J. C., Higley, L. B., and Boyd, J. D.: Dentistry for Children; Philadelphia, P. Blakiston's Son & Co., Inc., 1937; xi plus 373 pages.

[12]Gabel, A. B.: The American Textbook of Operative Dentistry; 8th ed.; Philadelphia, Lea & Febiger, 1949; 674 pages.

[13]McGehee, W. H. O., True, H. A., and Inskipp, E. F.: Operative Dentistry; 3d ed.; Philadephia, The Blakiston Co., 1950; xxix plus 699 pages.

CONTENT OF THE TEACHING PROGRAM

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1. The Class Room

The basic science courses should be designed to provide the best understanding of the human organism, in health and disease, that time and facilities will permit. Anatomy, histology, biochemistry, physiology, pathology, and bacteriology should be taught to provide a background for professional education which will produce a graduate able to think for himself and flexible enough to accept and practice improvements.

Needless to say, all courses should be kept abreast of recent developments. In addition to reading assignments in textbooks, students should be encouraged or required to read periodical literature for recent developments. Such assignments will help the student to realize that his subject is dynamic and up-to-date, not static. Basic principles, as well as facts, should be stressed in order that students may appreciate and understand subsequent developments in their own and allied fields. It is generally recognized that the clinical application of basic science knowledge, whether for medicine or for dentistry, is not adequate. According to the survey, our present teaching in these basic sciences concerns itself primarily with the morphology of the primary teeth. The teaching in the basic sciences should include genetics, embryology, growth and development, nutrition, bacteriology and chemistry of saliva, all of

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which are important in the diagnosis and practice of dentistry for children.

Student motivations also must be improved. Early and continuously during his preclinical study, the student must be made aware of the need for this foundation and background science material. Frequent student visits to the various clinics, including the children's clinic, may be one method in its accomplishment. In addition, the science teacher should take every opportuntiy to emphasize the significance of *fundamentals to clinical practice*. It must be recognized, however, that lack of time and experience often will prevent this emphasis and that the task will fall chiefly on the well-trained clinical teachers. Teachers of dentistry for children should take the lead in fostering mutual understanding, respect, and cooperation between teachers in the basic science fields and those in dentistry for children, as well as in all clinical fields of dentistry. Without this cooperation much of the time spent in basic science courses will be wasted.

Class-Room Course

The class-room course in pedodontics holds an enviable position in the program of instruction. It offers a real opportunity to provide the undergraduate student with the material needed to fill the break in continuity between the basic science courses and his clinical activities. The well-planned class-room course will also form a definite pattern of correlation betwen pedodontics and other clinical divisions, such as orthodontics, public health dentistry, oral surgery, periodontia, radiology, prosthetics, and diagnosis and treatment planning.

Every school answering the questionnaire offers a course of lectures in pedodontics. It seems that the majority of schools are making a conscientious effort to teach the theory and practice of pedodontics. Much of the subject matter taught in pedodontics is basic not only to pedodontics, but to other courses also. Growth and development, preventive orthodontics, oral hygiene and operative procedures constitute a major part of the class-room teaching in pedodontics. Thus, a contribution is made to the teaching of orthodontics, operative dentistry, and periodontia. Answers to the questionnaire show a similarity of subject matter, and further, that there is a lack of uniformity in the time and year in which the material is taught. This is shown by the fact that:

Two schools teach pedodontics in the first, third and fourth years;
Three schools teach pedodontics in the first and third years;
Three schools teach pedodontics in the second, third and fourth years;
Eleven schools teach pedodontics in the third and fourth years;
Twelve schools teach pedodontics in the third year only;
Two schools teach pedodontics in the fourth year only;
Five schools teach pedodontics in the first, second, third and fourth years.

A complete description of the course was not always included in the answers but the committee recommends an adequate class-room course should include at least the following subject matter:

1. *Patient-Parent-Dentist Management: Mental Hygiene for the Dentist.* It should be understood that the behavior of the child is a reaction to his environment and that the dentist has it within his power to modify or even to control that environment. Control will be best accomplished when it comes from an understanding of the child's behavior. It should be obvious that without proper cooperation on the part of the child, an adequate job of dental service is impossible.

   It is important too that the role of the parent in the dental office and in the supervision of the home program of oral hygiene and diet control should be clearly defined in the program of undergraduate teaching. Without a clear definition, the student may fail to understand completely the problem at hand.

   Mental hygiene of the dentist is an important aspect of the management problem. Undoubtedly, many management problems develop because of improper attitudes towards situations on the part of the dentist. Many factors may contribute toward the mental attitude of the dentist. It is important that the student become acquainted with them and be cognizant of their importance.

   (Three hours are considered a minimum amount of time in the introduction of this subject.)

2. *Ability to Perform a Thorough Prophylaxis for Children, Institute an Adequate Radiographic Survey, Complete a Comprehensive Diagnosis, and Devise a Proper Treatment Plan for Children.* The removal of stains from children's teeth constitutes a modification of technique of prophylaxis. The green and orange stains are rarely found in adult mouths, but are commonly found in children. Specific techniques for their removal should be taught.

   Students should be taught the importance of an adequate radiographic survey for children. The use of small films, bitewings, and occlusal views requires the teaching of modified techniques in radiography. The interpretation of these radiographs is different too from that in an adult radiographic survey. The presence of many more teeth in children than in adults presents a complication in interpretation Anomalies, too, require very accurate radiographs and special experience in interpretation, if they are to be properly diagnosed. The radiographic changes noted in the periodontal membrane in cases of pulp disturbances are peculiar to children and should be interpreted for the student by the teacher in pedodontics.

   Without good diagnosis the patient cannot be properly treated. The student should learn the importance of good mirrors, exploring tines, compressed air and light in making a mouth examination. The modifications in contact areas and positions of cavity locations should be pointed out to the student. The use of the salivary tests in determining the caries activity of the child should be taught, and as new scientific tests are developed and validated they should become a part of the teaching program. The use of study models in observing growth and development of the mouth needs emphasis in pedodontics. After a diagnosis is completed, it is necessary to develop a treatment plan which will permit the intelligent and economical use of the student's time and at the same time assure the patient of the best treatment available.

   (The minimum time allowed for the teaching of the above material should be 6½ hours.)

3. *Ability to Teach Proper Home Care of the Mouth.* With strong emphasis on prevention of oral disease in its relation to home care of the mouth, it is very desirable that the student should be able to teach the child and the parents the importance of the subject. The subject cannot successfully be handled in the same way that it would be managed for the adult patient. The level of maturity of the child and his attitudes require different handling from those for the adult.

   (One-half hour is a minimum time requirement for teaching this phase of the subject.)

4. *Ability to Apply Proved Preventive or Control Techniques.* The prevention and control of oral disease and deviations in occlusion are particularly pertinent in pedodontics. Children are very liable to develop caries and gingivitis and to affect the occlusion by the abnormal pressure habits, unless some measures of prevention and control are instituted.

   (A minimum of five hours is needed to teach this area.)

5. *Working Familiarity with Pulp Therapy, Restorative, Prosthetic, and Surgical Procedures Involved.* The operative procedures involved in the restoration of the primary and young permanent teeth require the teaching of modified techniques. The difference in the morphology, anatomy and histology of the primary teeth indicate this need. Pulp therapy for children has also developed into a field almost entirely different from pulp therapy for the adult patient. A rich blood supply, large pulp canals and physiologically incomplete root ends have made pulpotomy a successful operation in children. Improvement in apicoectomy has made possible the saving of many non-vital single-rooted permanent teeth for children. The prosthetics employed for children consists usually of space maintainers, partial dentures, occasionally a complete denture, gold crowns, porcelain jacket crowns, appliances for arresting abnormal pressure habits, and bite planes. Because of the growth problems involved, these appliances require either modified techniques or those entirely peculiar to pedodontics.

   Some surgical procedures, too, require special handling when employed for children. The removal of primary teeth with complete or nearly complete root structure, the removal of a submerged primary molar, and apicoectomy require modified surgical techniques for expedient management.

   (A minimum of 15 hours is recommended for the teaching of this portion of the program.)

6. *Treatment and Restoration of Traumatized Teeth.* Starting with the care of the pulp and ending with the restoration of the tooth requires a knowledge of techniques not usually employed except in children. The employment of pulpotomy in those cases where a vital pulp is exposed, requires special knowledge. The restoration of the crown is usually different from that used in adult patients. A modified three-quarter crown technique is best taught by the pedodontist who employs it regularly. In older children when a full crown is used, a modified technique is indicated.

   (A minimum of one hour is recommended to teach this subject.)

7. *Recognition and Treatment of Periodontal Conditions.* Periodontal disturbances in children may have their etiology in local or systemic conditions. The factors involved should be recognized and corrected as far as it is possible to correct them. Hard and soft deposits on the teeth and functional occlusion may play a role in

gingivitis. Diet, nutrition and glandular disturbances may be factors in the systemic picture.

(A minimum of one hour is recommended for the discussion of this subject.)

8. *Ability to Recognize and Deal with the Pertinent Health, Growth and Developmental Factors of Child Patients.* In this area it must be assumed by the teacher in pedodontics that the broader aspects of the basic material have been taught to the student. However, a guide for clinical application of the basic and fundamental information should be offered in order to prepare the student for rendition of intelligent preventive service. The subject matter in growth and development should include information in regard to psychological aspects. It should include, too, certain phases of physical diagnosis.

(A minimum of six hours is considered necessary to teach this subject.)

9. *Knowledge of Practice Management Techniques.* In this area would be included the important subject of parent management, particularly from the standpoint of presenting the case to the parent. An adequate recall system is especially important for children and the student should be made thoroughly familiar with the mechanics of recalls and their benefits. This is an important phase of pedodontics and should not be minimized in a teaching program. A discussion of the economics of pedodontic practice should also be included.

(A minimum of two hours is recommended for teaching this subject.)

10. *Responsibility in Participating in Community Health Programs.* This is actually a part of the teaching in public health, but it is the duty of the teacher in pedodontics to see to it that the subject is not neglected. The student should be taught what his responsibility to school and community health programs ought to be when he becomes a practicing dentist. Without his active support such programs cannot be considered successful.

This constitutes the class-room program which should require about 40 hours. It is recommended that 36 to 48 hours be used for this part of the course, depending on the foundation which the student has received in other departments.

II. The Laboratory and the Clinic

Laboratory Instruction

Although only thirteen schools reported specific laboratory courses in dentistry for children, beginning in the third year, averaging seventeen hours, and four additional schools reported similar courses averaging nine hours in the senior year, the majority of schools reported that specific laboratory procedures in dentistry for children were performed in other courses such as dental anatomy, orthodontics, and operative dentistry. Correlation of laboratory instruction with clinical procedures is obtained in nineteen schools by use of the same person or staff, while seven schools reported clinic demonstrations covering laboratory material.

The committee recommends that all laboratory instruction pertaining to dentistry for children be under the direct supervision of a member of

the pedodontic department, or that the teaching of subjects or phases of other courses which pertain directly to dentistry for children be coordinated with the teaching in the pedodontic department.

The committee recognizes that certain laboratory technical procedures are essential to clinical experience and recommends that where those procedures which pertain to dentistry for children are taught in other courses, they should be coordinated with the teaching in the pedodontic department. The committee also recommends that provision be made for the assignment of special laboratory exercises in areas where modification of previously taught technics is necessary.

Clinical Instruction

Evaluation of replies to the several parts of this question is difficult, but a relatively accurate compilation is appended for record and study.

The committee feels that correlation of the various phases of instruction in pedodontics is accomplished best by the use of the same teaching staff, but where certain phases are taught in other departments, interdepartmental conferences should be held to correlate the teaching—e.g., dental anatomy, orthodontics, pulp canal therapy, operative dentistry, etc.

A separate children's clinic is desirable, just as a separate department is indicated for pedodontics. Twenty-two schools reported separate children's clinics, two reported their work was done in a children's hospital, while four had separate sections of the adult clinic.

Recommendations

The committee suggests that a minimum of 120 hours clinical practice be devoted to dentistry for children, which should include the care of pre-school children. Reported clinic requirements were from "none established (9)" to 168 clinic hours (1), and were difficult to assay because no "common denominator" was available. Thirty-six schools reported routine use of bitewing radiographs, twenty-three reported use of the bacterial count and eight of the Snyder test, for caries susceptibility determinations. The committee recommends that emphasis be placed on the use of all valid scientific tests and methods for accurate diagnosis and prognosis, in order to impress the student with the application of sound scientific knowledge to clinical practice.

From the questionnaire it is evident that practically all schools teach some method of caries control, varying from application of sodium fluoride (39), adequate diet (31), limitation of refined carbohydrates (39) to toothbrushing and home care (7). The committee recommends the use of all valid scientific knowledge in aiding the operator to prescribe a means of caries control.

Dentistry for children requires closer supervision than does operative dentistry for adults and it is recommended that one instructor be provided for each forty-six students. The committee recognizes there is a shortage of adequately trained teachers in this field and recommends that each instructor have graduate or postgraduate instruction in dentistry for children.

Fees

The committee recognizes that certain schools have valid reasons for a difference in fees charged children and adults for similar procedures (19 schools reported differences, 18 reported no differences). We feel, however, that care should be taken to impress upon the student that the remuneration for dentistry for children should equal that expected for dentistry for adults. Every effort should be made to eliminate the conception of the student that dentistry for children is a less profitable phase of practice.

THE SURVEY: A QUESTIONNAIRE

Prepared and submitted by
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The questionnaires which the Committee on Instruction in Dentistry for Children sent to the deans and the teachers in the forty-seven dental schools of the United States and Canada contained a variety of questions concerning the undergraduate teaching program. Some of the questions could be tabulated readily while other questions did not lend themselves to this form of recording.

The following is a summary of the more significant replies which the committee decided could be readily tabulated:

Deans' Replies

1. List objectives of your program of instruction in Dentistry for Children.
   a. Educate undergraduate students so that they can adequately provide preventive and corrective dental treatment for children in their practices, 39.
   b. Impress upon the student, and develop an awareness of the importance of and the necessity for dentistry for children, 15.
2. Changes you like to make in your program of Dentistry for Children.
   a. Would like to expand program, 13.
   b. Would like additional faculty, 7.
   c. Carry out present program more effectively, 5.
   d. Would like closer cooperation with other departments, 6.

[1]Chairman, Survey Section of the Committee, and Professor, Pedodontics, University of Nebraska.

3. What is the attitude of the faculty members of other departments toward the program in Dentistry for Children?

   Favorable, 36; Indifferent, 0; Resentful, 0.

   Typical comment: The attitude of the dental college faculty has never been resentful toward Dentistry for Children. However, there is much more interest manifested in pedodontics today than in the past. All members of our faculty realize the importance of this subject and are most cooperative with the Department of Pedodontics.

4. What difficulties or obstructions arise in providing instruction in Dentistry for Children?

   a. None of consequence, 10.
   b. Inability to make adequate provisions for clinical facilities, 7.
   c. Inability to obtain good teachers, 10.
   d. Difficulty in getting child patients for all hours of the day, 4.

Teachers' Replies

1. In your opinion, what activities does dental service for children include?

   This question was interpreted in three ways: All of the oral health services that are necessary for a complete children's program; the children's oral health services which should be taught to undergraduate students; and the educational activities which have to be utilized throughout the entire dental school curriculum in order to train an undergraduate student for the practice of dentistry for children.

2. List the objectives of your program of instruction in Dentistry for Children.

   a. Provision of sufficient clinical experience in the various procedures of a complete practice for children, 29.
   b. Development of sufficient student interest in the practice of dentistry for children to make the graduate desire to include child patients in his practice, 15.
   c. Demonstration of the value of preventive dentistry, 13.
   d. Teaching of office management and treatment planning that will make practice for children economically sound, 8.
   e. Development of an understanding of the processes of normal growth and development, 8.
   f. Development of the ability to recognize a child's emotional development, 8.

3. Indicate year by year the instruction that a typical dental student receives in Dentistry for Children through the undergraduate curriculum of your school.

   First Year and Second Year:

   Thirty-three of the thirty-eight schools reporting did not begin comprehensive instruction until the third year.

   Third Year:

   a. Thirty-eight schools report didactic training in the third year varying from 4 to 48 hours, averaging approximately 24 hours.
   b. Fourteen schools report laboratory training in the third year varying from 3 to 48 clock hours, averaging 17.
   c. Twenty-nine schools report assigned clinical courses varying from 6 to 216 hours, averaging 71 hours.

Fourth Year:

a. Twenty-two schools report didactic training varying from 4 to 36 hours, averaging 14 hours.

b. All schools reported clinical work in the senior year varying from 4 to 200 hours, averaging 97 hours.

c. One school reported 20 hours spent by seniors studying pediatrics at a children's hospital.

4. The number of schools which reported that special laboratory procedures in dentistry for children, if any, were performed in other courses are as follows: Dental Anatomy, 27; Operative Technics, 12; Orthodontic Technics, 26.

a. Is there a difference in fees charged for children and for adults:
No, 21; Yes, 21.

b. Do you have a separate Children's Clinic?
No, 20; Yes, 20.

c. Caries susceptibility tests used in schools:

	Yes	No	Occasionally
Bacterial count	20	5	7
Snyder test	10	12	4
Periodic bite wings	14	1	1

d. Caries control technics used in schools:

	Demonstration	Occasionally	Routine
Prescription of adequate diet	6	22	10
Limitation of carbohydrates	3	11	27
Topical application of sodium fluoride solution	2	19	29
Prescription of fluoride mouthwash	5	8	15
Use of impregnation technic	9	3	
Prescription of ammoniated dentifrices	2	14	

e-1. How many instructors?

Instructors	No. of Schools
1	2
2	9
3	12
4	2
5	6
6	2
8	2
10	2
24	1

2. How many instructors with formal graduate or postgraduate training?

Instructors	No. of Schools
1	11
2	5
3	11
4	4
5	3
6	1

5. Are the teaching of Dentistry for Children and Orthodontics correlated?
Yes, 27; No, 8.

6. a. Are the teaching of Dentistry for Children and Public Health correlated?
Yes, 17; No, 9.

b. Field trips were reported in 8 schools.

7. a. How is the teaching program organized?
Separate Department, 32; With Operative Dentistry, 5.

b. Departmental titles were: Pedodontics, 25; Dentistry for Children, 8; Dental Pediatrics, 3.

8. The principal difficulties and obstructions in providing instruction were:
   a. Limitation of physical facilities, 11.
   b. Lack of time in curriculum, 8.
   c. Lack of qualified teachers, 11.
   d. Lack of funds, 7.
   e. Inability to have children in school hours, 2.

THE RELATIONSHIP OF INSTRUCTION IN DENTISTRY FOR CHILDREN TO INSTRUCTION IN OTHER FIELDS OF DENTAL SERVICE

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In a discussion of the relationship of the teaching of dentistry for children to the teaching of other fields of dental service, it is of interest to know the attitude of the faculty members of other departments towards the program in dentistry for children. Of the 43 questionnaires returned, 41 stated that "the attitude of the faculty members of other departments toward the program in dentistry for children" was "favorable," one said the attitude was "resentful," and one said the attitude was both "indifferent" and "resentful." With such a preponderance of favorable attitude, it would seem that the program in dentistry for children has filled a definite need in the dental school curriculum, and has established a good relationship with the other fields of dental service. This good relationship may be more one of mere tolerance, or, as one teacher said it is, the attitude of ". . . some who feel a little sorry for the pedodontist, largely because they do not have a correct concept of the field."

On the other hand, the pedodontist and the teacher of operative dentistry have worked closely together in order to develop a generally accepted system of cavity preparation for child patients. The pedodontist has adopted many of the endodontic technics, sometimes without any modification. The relationship of the pedodontist and the preventive dentist has been very close, since the child has become the "proving ground" for caries control procedures. The pedodontist and the radiologist, in close cooperation, are seeking more efficient ways of making radiographic surveys for child patients without simply using smaller sized films. The pedodontist and the prosthodontist are studying the partially or completely endentulous child patient to determine what technics may be necessary for efficient denture service. The pedodontist and the oral

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surgeon are cooperating in the development of long range programs for the treatment of the cleft palate patient, the cerebral palsied patient and other crippled child patients.

The fundamental difference between instruction in pedodontics and instruction in the other fields of dental service lies in the fact that the child is growing. This difference demands a special consideration of growth as it relates to every dental operation. And yet, there is little general agreement on the instruction which the dental student should have in order to guide intelligently the dental development of the growing child. In an attempt to outline the knowledge of growth and development necessary for the undergraduate student, the committee asked Question 10, Part A, "Are the teaching of dentistry for children and the teaching of orthodontics correlated in your institution?" and Part B, "Please indicate what you regard as the ideal relationship of the instruction in these two subjects."[2]

Orthodontics

Of the 43 replies, 27 stated that there was a correlation of the teaching of pedodontics and orthodontics, four qualified their affirmation by phrases like "in certain respects," "not entirely," "to some extent," and "some clinical (correlation)"; eight reported no correlation, one of which didn't have an orthodontic department; and four left the question blank. By "correlation" most responses implied that the pedodontist and the orthodontist correlated their lecture material and mutually consulted about clinical cases. In some instances growth and development and diagnosis were taught in the pedodontic department, in other instances in the orthodontic department. In one instance, space maintaining appliances were taught in the orthodontic department, in other instances in the pedodontic department. In one instance clinical orthodontic treatment was being conducted by the pedodontist. In one school cases are reviewed by the two departments in a monthly study group. In another school the two departments discuss the specific technics to follow in a given case. At another school it was stated: "All cases that present for operative work in the pedodontic section and require orthodontic advice are referred to the orthodontic division and (its) recommendations are charted on the patient's record. If the deviation from normal does not fall into the category of real orthodontics, so to speak, the correction is done in the pedodontic section under the guidance of the orthodontic division." At another school the director of the department of dentistry for children is an associate instructor in the orthodontic department. The

[2]Not a part of the survey published herewith.

correlation at one school is encouraged by an exchange of course outlines. At still another school the student and a representative of each of the two departments discuss any case which involves a growth problem.

Eleven schools reported satisfaction with the arrangement between the pedodontic department and the orthodontic department as it exists in their schools. No two of these relationships were alike; therefore, it is evident that there is a wide variation in the concept of the ideal relationship of instruction in pedodontics and orthodontics. However, in the statements of the ideal relationships, several ideas were expressed which may lead to a better general pattern of knowledge which the undergraduate student should receive regarding occlusion. An emphasis of the technics of observation of growth and development was expressed. One school suggested that each freshman dental student be assigned several children so that he could observe their growth and development throughout the four-year dental training period. Another school suggested that the two departments "interchange lectures." A complete merger of the two departments was suggested by five schools, three of which indicated that there should be one department head for the two fields, and the other two stated that the two subjects should be "taught as one course." However, a common clinic was the most frequently mentioned method of improving the correlation of the teaching of dentistry for children and the teaching of orthodontics.

A further study of the survey revealed many valuable suggestions, but the committee feels that more definite information should be provided for the general practitioner in order that he may head off tendencies which may subsequently develop into major orthodontic problems.

In order to bring this question to the front, the committee prepared a list of specific growth problems which are of common interest to the pedodontist and the orthodontist. This listing has been prepared not with the idea that the task falls upon any one department to teach all of the principles of diagnosis and treatment of these conditions, but rather that the dental student should receive this instruction from the best sources. The committee does not assume that this list is by any means complete; there probably will be individual disagreements about the types of cases which are included and others which are not included. Furthermore, advances in knowledge of the growth processes which involve the teeth undoubtedly will demand revisions in the future. The following is a list of conditions that may be considered the common ground of both the pedodontist and the orthodontist:

1. Space maintainers. The definition of premature loss of primary teeth and indications for space maintenance, either functional or non-functional.

2. Congenital absence of teeth. The decision regarding maintenance or closure of spaces created by the congenital absence of permanent teeth.
3. Supernumerary teeth. The detection of supernumerary teeth, and consideration of their effect on the eruption and alignment of teeth.
4. Prolonged retention. The consideration of possible effects of prolonged retention of primary teeth on eruption and occlusion, and decisions regarding treatment.
5. Retarded eruption. The determination of possible factors inhibiting eruption and decisions regarding treatment.
6. Oral habits. The detection and management of habits that affect occlusion.
7. Ectopic eruptions. The consideration of possible effects of ectopic eruption of teeth on alignment and occlusion, and decisions regarding treatment.
8. Ankylosis. The determination of the effects of ankylosed teeth on occlusion, and decisions regarding treatment.
9. Guidance of teeth into better alignment in cases of: (a) early loss of permanent teeth where the space created by such loss has not been maintained and some tooth movement may improve the axial relationship of the adjacent teeth and assure a more satisfactory prosthesis; (b) anterior or posterior teeth in buccal or lingual version, including teeth in a cross-bite relationship, when the space for correction is sufficient and the horizontal and vertical depth of the overbite is not extreme; (c) retraction of spaced maxillary incisors when accompanied by good mandibular arch form and a normal arch relationship; and (d) primary molars that need proximal slicing to allow normal eruption of adjacent permanent teeth.
10. Observation of normal growth and development over a period of time by radiographs, study casts and height and weight measurements, and the evaluation of these data. If the observation is carried on over a sufficient period of time, there will be a realization of the fact that certain natural adjustments take place in the positions and relations that some teeth assume at the time of their eruption compared to the positions and relations in which they are eventually established.

These, therefore, are the areas in which the fields of the pedodontist and the orthodontist overlap and wherein a greater use of the available knowledge may be achieved by a more enlightened division of labor.

Public Health Dentistry

In contrast to the general feeling of pedodontists that their field of endeavor could be enlarged in the direction of a better understanding of growth guidance, there seems to be a lack of understanding by pedodontists about their responsibility in the community aspects of dentistry for children. In reply to Question 11, Part A, "Are the teaching of dentistry for children and the teaching of public health correlated in your institution?" 16 answered "yes," 24 answered "no," and three left the question blank. Regarding any direct contact of students with public health activities, such as field trips for observation, there was even less

use made of this technic in teaching. Only eight schools utilized it; 33 did not; and two did not answer the question.

The replies to the question, "What do you regard as the ideal relationship of the instruction in these two subjects (dentistry for children and public health)?" revealed that not many teachers of pedodontics have a precise conception of what may be expected of the dentist in guiding community dental programs. Two said that they had "no comment" regarding the ideal relationship, and two said that they did not know what the ideal relationship should be. Perhaps the teachers of pedodontics feel that the dentist will be well enough informed in dentistry to be able to give advice in a program of lay health education, without taking time in a crowded dental curriculum to inform the student how such an educational program may be organized. Perhaps the teacher of pedodontics feels that it is much more necessary to educate the student thoroughly in the technical aspects of care of children and leave the application of these technics on a community-wide basis to the individual dentist's judgment. Perhaps, further, the teacher of pedodontics does not appreciate the treatment programs of public health dentists because he thinks that these activities are less than a complete service and more often than not are carried out by a person who has had no special training in dentistry for children. Perhaps, finally, the teacher of pedodontics is not sympathetic with public dental programs. At least it is apparent that the teacher of pedodontics and the worker in public health dentistry are not very close together. Possibly a closer relationship could be achieved if the pedodontist were to formulate for the public health worker a list of those technical services which he feels are essential to the dental health of the child, and if the public health dentist were to enlighten the practicing dentist on the community aspects of dentistry.

DENTISTRY FOR CHILDREN: A RECOMMENDED UNDERGRADUATE PROGRAM

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1. Introduction

The programs of the last three meetings of the American Association of Dental Schools seem to have been forging doggedly ahead with a specific job of curriculum emphasis. Insidiously, perhaps, but nevertheless industriously, a job of shaping, hammering together, sandpapering, painting and lettering has just been completed. Tonight, the orthodontists and the children's dentists are poised to erect a new signpost. Its modest lettering reads: "At this point in dental curriculum develop-

ment, a major shift in emphasis is in order. A challenge has been accepted to direct an increasing volume of scientific dental treatment to those age levels during which patients stand to gain optimum benefits." The members of the Committee on Instruction in Dentistry for Children, at least, are expressing their hope that the studies of the teaching programs in orthodontics and in dentistry for children will have been sufficiently searching and will have been presented convincingly enough to stimulate faculties to consider seriously such a change in emphasis—not only to initiate it but to desire to do so.

The last task in the report of the Committee on Instruction in Dentistry for Children is a summation of the recommendations, already presented, which warrant consideration by the members of this association. Recommendations may be logically presented which deal with, 1) the objectives and scope of practice for children, 2) the content of the teaching program, 3) its relationship to other branches of dental teaching, and 4) its implications for desirable research.

2. Objectives and Scope of Practice for Children

Charles F. Kettering, of General Motors' research fame and a writer of pithy truths, remarked one time: "It always is well to know where one is going, when embarking on a new program of research, otherwise one may never know when he gets there." Taking this leaf from Mr. Kettering's album of cogent remarks, it appears sensible first to state the objectives of a program for teaching students dentistry for children and then to outline the scope of activities necessary to motivate these objectives.

The committee realized, as soon as it began assembling its material, that objectives scarcely could be recommended to any dental faculty. Objectives have to be acknowledged locally in terms of understandings, abilities, appreciations and attitudes as staff members and students live them and are motivated by them. On the other hand, committee members did feel that they could recommend the activities to attain teaching objectives because a common scope of scientific practice for child patients now can be delimited.

Unfortunately, the respondents were confused in their answers to those portions of the questionnaire which were directed at objectives and the activities to be included in dental service for children. As an objective, for example, one reply would read, "Provide sufficient clinical experience to teach the procedures essential for the complete practice of dentistry for children," while another answer would read, "Teach the pulp management technics which have to be employed for young teeth."

Still another reply would read, "Develop an understanding of the activities of public dental health," while still another would read, "Teach the management of children's fractured anterior teeth."

In spite of this confusion in definition, the two statements of objectives most frequently listed coincided quite well with the teaching objectives adopted by the committee members, themselves, during their initial planning meeting. These two objectives follow: 1) "develop graduating seniors who are willing and able to help each child grow to adulthood with a well-functioning dental apparatus" and 2) "develop new dentists who are capable of contributing to a child's physical, emotional and social health by anticipating, detecting, preventing, repairing and correcting departures from a state of oral well being." School faculties also may wish to ponder these objectives as they were stated.

Some educated lay people, even some physicians, have embarrassed individual dentists by asking, "Why is dentistry a health profession?" Likewise, in the past, some dental faculty members have embarrassed some other faculty members by demanding, "Why should dentistry for children be considered a separate program in the curriculum of a school of dentistry?" This embarrassing question, regarding separate emphasis, could have been answered, "because, without separate emphasis, very little scientific practice for child patients ever becomes available." The committee chose, however, to state positively the activities which are included in the practice of dentistry for children, some of which distinguish it from practice for adults.

These activities, as argued out by committee members in their Washington meeting, involve faculty teaching and student development of ability

"1. To manage the behavior of the patient, the parent and the dentist;
"2. To perform a thorough prophylaxis, institute an adequate radiographic survey, complete a comprehensive diagnosis and devise a proper treatment plan for child patients;
"3. To teach proper home care of the mouth;
"4. To utilize scientifically proved preventive or control technics;
"5. To work familiarly with the modified restorative, pulp therapy, prosthetic and surgical procedures demanded for the primary and developing permanent dentitions;
"6. To treat and restore traumatized teeth scientifically and esthetically;
"7. To recognize and treat incipient, acute or chronic periodontal disease in young patients;
"8. To recognize and deal with all of the health, growth and developmental factors which focus in a patient's oral cavity during his primary, mixed, and young permanent dentition periods;
"9. To utilize productive, practice management technics;
"10. To accept responsibility for participation in community child health programs."

Five replies to the questionnaire stated, in substance, "every phase of dentistry, when practiced for young patients, constitutes dentistry for children."

3. Content of the Teaching Program

Realizing that the dental student's impression of the scope of practice for children will be no more scientific or comprehensive than the program and teaching facilities that each school provide, the committee examined most carefully those portions of the replies to the questionnaire which dealt with the contributions of, 1) the basic science courses, 2) the class-room course, 3) the laboratory course, and 4) the clinical activities. Then the committee agreed on a number of recommendations to be presented to teachers attending this meeting.

Basic Science Courses

Insofar as the contribution of the basic science courses are concerned, the committee members were agreed that the traditional content of such courses requires critical, recurring examinations, in order to make sure periodically that students are being provided with the necessary information and ability to diagnose, prevent disease or mal-development, and to plan and complete treatment that is in the best interests of the individual patient. If, in the future, a functioning balance of clinical practice is to be maintained for patients during the period of the preschool dentition, during the period of exchange of dentitions, during the young adult period and during the mature adult period, and if procedures are to be utilized which assure a transition from period to period with optimum benefit to the patient, none of the foundation science courses can neglect content which is required at any one of these age levels. The committee members felt themselves in position to state with assurance that a legitimate emphasis of treatment would require some shifts of emphasis in foundation courses and that these shifts should be concerned largely with a better comprehension of how human beings grow, develop and behave. The shift in subject content points, then, to a weighting of information from those areas of genetics, embryology, seriate development, behavior patterns, nutrition, clinical medicine, metabolism, tissue reaction, bacteriology and morphology which will aid teaching staffs to develop diagnosticians and clinical practitioners who can provide scientifically for oral health needs during all of the periods of growing to adulthood.

The committee members realized, further, that the benefits from basic courses, which may accrue to a student and, through him, to his patients,

depend very directly on a functional correlation of clinical activity with preclinical or nonclinical study.

Class-room Course

The well-planned class-room course should provide a strategic liaison between foundation science courses and clinical activity. Its value to any clinical field of practice depends on its content, its motivation and its timing. Again, study of the returned questionnaires, followed by committee discussion, lead to recommendations.

Today's comprehensive class-room course, the committee members agreed, should provide scientific information about and should motivate all ten areas of ability which were submitted earlier in this paper as the legitimate scope of dental practice for child patients. The amount of time, in terms of lecture requirement, the committee estimated at 36 to 48 hours, realizing that this requirement would vary in different schools with the extent of the foundation already contributed by other departments. By far, the best timing of lectures appears to be just in advance of clinical practice, timing which reduces, to the shortest possible lapse, the hiatus from group instruction to individual performance.

Laboratory Course

The lack of uniformity detected by the questionnaires and some disagreement among committee members did not prevent an appraisal of the contribution of the laboratory technical course and, hence, the development of recommendations. The answers to the questionnaires made it obvious that, in the teaching of dentistry for children, a variety of patterns was being utilized to prevent overlapping of technical instruction, to reduce the time spent on preclinical technical procedures and to prevent a disrupting lapse in time between technical instruction and clinical application. It may be recalled that but thirteen of the schools reported specific laboratory courses of seventeen hours in duration and four additional schools of nine hours in duration.

Nevertheless, the committee felt justified in recommending the consideration of three points which concern preclinical technical instruction. The committee suggests 1) the supervision or coordination by a member of the pedodontic staff of those portions of laboratory technics which have special significance to practice for children, 2) the utilization of additional special laboratory assignments only for those areas in which necessary modifications of previously taught technics have to be demonstrated, and 3) the timing of the laboratory course, like the class-room course, to precede as immediately as possible actual practice for child patients.

Clinical Instruction

Because of varying clinical facilities and organization of faculties for clinical teaching, a variety of opinions was expressed in the answers to that portion of the questionnaire which concerned clinical routine. Committee discussion did point out areas of agreement on the factors which assisted good teaching. These areas of agreement may be presented as recommendations:

1. To secure continuity of teaching and, thereby, achieve less confusion on the part of the student, more rapid development by the student and a more adequate student concept of the scope of practice for children, it was recommended that a separate staff be designated.
2. Since poorly behaving children and lack of continuity in a patient's treatment prove an embarrassment for everyone, a separate, specifically-organized, compact clinic with equipment designed for child patients can be urged strongly.
3. Since student practice for the complete needs of child patients requires relatively close supervision and frequent demonstrations or assistance, an instructor-student ratio of one instructor to four-six students has been suggested.
4. Since many more technics of prevention or control now have to be integrated into private practice than just five years back, it is recommended that provision be made in the clinical situation to emphasize and interpret these technics.
5. Because it now has been demonstrated that students can be taught to manage the behavior of preschool patients and provide for the oral health needs of such young patients, it can be recommended that an effort be made to provide the student with sufficient operative experience to master clinical dentistry for patients in all of the younger age levels.
6. Inasmuch as the committee found difficulty in reaching a decision regarding a "yard-stick" of minimum specific clinical requirements, but was confronted with a definite requirement that sufficient clinical experience be gained for the complete practice of family dentistry, it has recommended merely that a minimum of 120 hours of clinical practice be devoted to dentistry for children.
7. Because it was found that concern had been expressed in the answers to the questionnaire that students often gain the impression that dental procedures for children are unremunerative, the committee has recommended that a definite effort be exerted to impress student operators that remuneration in one's private practice should be equal for similar time-consuming procedures in either a child's or an adult's mouth. This recommendation appeared particularly pertinent in those schools that find a good reason for reducing the clinical fee scale for child patients.
8. Finally, since clinical teaching will progress no faster than the horizons and capabilities of the clinical staff will permit, the committee has recommended, as a goal, research and graduate or postgraduate study for each staff member.

4. Relationship to Other Branches of Teaching

One of the most treacherous areas of intramural relations, probably, is the allocation of instructional clock hours to each of the programs of dental teaching recognized in the various schools of dentistry. Each school's administrator presumably should find some problems involved

in a decision regarding that portion of 3800 to 4400[1] clock hours[2] which he can assign to the competing teaching units that he recognizes in his school's curriculum. Presumably, too, each division chief feels that he could secure better performance if he just could get more time in which to attain it.

Recognizing that a decision regarding time priorities does have to be made in every well-balanced curriculum, the committee members studied this problem of teaching time to see if they could arrive at a statement of a reasonable allocation of clock hours in which to emphasize adequately oral health care for children. In the first place, they found that the hard, cold data of the 1950 census indicate that between one-sixth and one-fifth of the prospective dental patients are within the age group of three through twelve years, while almost exactly one-quarter of this country's population is within the age group of three through seventeen years—from the beginning of nursery school to the completion of high school. As a matter of mere statistical justice, the report of the recent census appears to argue that about one-fifth of a dental student's training should be directed toward the achievement of adequate practice for young children.

Whether such a statistical decision is valid or invalid, next would have to be appraised on the basis of the comparable amounts of time required for securing diagnostic and technical competence to practice for children and for adults. This question also was explored by the committee, because the addition of hours to the program of dentistry for children presumably would subtract hours from the traditional foundation science courses, or from the other clinical courses such as restorative dentistry, crown and bridge prosthesis, partial and complete denture prosthesis, minor oral surgery, pulp therapy and root surgery, periodontics and orthodontics or from some of the supporting courses such as technics, dental materials, caries control, therapeutics, radiology, clinical diagnosis and treatment planning or from some of the courses in public relations such as dental jurisprudence, ethics, history, office management and public health dentistry. Perhaps some shifting in hours is justified on the basis of statistical considerations, concluded committee members, but, by far the most important recommendation to dental faculties is the suggestion that the entire curriculum be studied for desirable shifts in emphasis since the conclusion is a bit inescapable statistically that a proportionate time allocation of student practice be granted to patients in all age groups.

To the teacher who has specialized in the technics of adult dentistry, it may be difficult even to consider that the practice of general dentistry for children possibly could furnish a rather rich experience, with minor

exceptions, in the use of those clinical technics of practice employed for adults. The committee felt that a short consideration would lead to the conclusion that, where necessary, minor shifts in traditional emphasis could be made in the content of preclinical or nonclinical courses without lengthening their present clock hours. The committee members insisted, however, that a number of questions be raised concerning the relative teaching value of clinical practice for child and adult patients. The clinical specialties, hence, will be interrogated in the order listed.

1. *Restorative Dentistry.* Immediately the question should be raised, "Is there any valid reason why fine restorative dentistry cannot be taught with child patients?" The committee felt that one additional question should be raised, "Is there not a challenge to fine technical skill in the proper restoration of a Class II cavity for the morphologically different primary first molar, or a restoration for the fractured crown of the incompletely calcified permanent incisor, for the pulpectomized first permanent molar prior to the eruption of the bicuspids, for the gold foil filling of the buccal pits of young permanent lower molars, for the reduction in size and reshaping of a primary molar crown in the absence of its successor, for the construction of a porcelain veneer crown for hypomatured or for traumatized incisors?"
2. *Prosthesis.* The committee was ready to concede that fixed bridgework will have to be taught on adult patients, although investigation, through clinical observation, is beginning to indicate that anterior fixed bridges may be placed relatively early after the permanent cuspid to cuspid dimension has been established. The committee was ready to concede, further, that the teaching of much of partial and complete denture construction would have to be channelled to adult patients, although the partial and complete dentures required to be planned for young mouths are not infrequent in number and dentures for developing arches present a challenge in impression taking and design which is quite foreign to routine adult denture construction, particularly for the child with a palatal cleft.
3. *Minor Oral Surgery.* The committee felt that the oral surgery problems of childhood should not be dismissed with a fleeting recognition of the routine minor extractions and the major oral and plastic surgery procedures for the very young patient born with oral clefts. It should be remembered that the treatment of the dental anomalies involving the exchange of dentitions, and deviations of number, of shape, of texture and of position of individual teeth are concentrated, to a large extent, in childhood. Anomalous development often challenges diagnosis and the ensuing surgical interference. The ectopic eruption of permanent teeth, the ankylosis of primary molars, twinning, fusion, supernumerary teeth, failure of eruption of teeth and abnormal tissue attachments constitute a partial list of problems which arise from anomalous development in children's mouths.

   Once a scientific program of child-patient diagnosis and care is inaugurated clinically, the surgical implications are found to involve much more than the picking out of primary teeth loosened by resorption.
4. *Pulp Therapy and Root Surgery.* There can be little doubt that the challenges to the pulp therapist are numerous and varied in the children's clinic. In the past, in fact, many of these challenging conditions were dismissed as too difficult for a dentist to manage. Two different dentitions of young teeth are available

to present problems to the operator and the opportunities for variation of practice run the entire gamut of pulp-management conditions, cavity medication, exposed vital and devitalized pulps in primary teeth, with partially resorbed root-ends, or in permanent teeth, with incompletely calcified root-ends, cystic root-end areas, fractured roots, internally resorbed crowns, discolored crowns, displaced teeth and teeth completely removed from their sockets by trauma. As far as the teaching of pulp management is concerned, a mere change of patient emphasis in clinical practice would assist the children's dentist tremendously and there would be absolutely no loss of challenge to scientific performance on the part of the student.

5. *Periodontics.* Recent surveys appear to indicate that about as many child patients in a population suffer from rather involved periodontal disease as adult patients in the same population.[3] Granted that more studies are required to decide prevalence rates completely, a challenge appears to be emerging for the pedodontist to shift more of his emphasis to the treatment of the soft and supporting tissue conditions of child patients.
6. *Orthodontics.* Inasmuch as the programs in orthodontics and dentistry for children must focus on the care of the same age groups, the committee found more difficulty in achieving a clear-cut delimitation of responsibility for teaching. The committee members, however, were highly critical of the oft-repeated statement that years of experience and training are required before a general practitioner of dentistry for children can diagnose those cases of malocclusion which are "simple" and, therefore, within his scope of treatment. The committee accepted this challenge; it enumerated a group of conditions in which treatment can be taught and practiced in the children's clinic; and it recommends to faculties that further study and refinement of such a statement be undertaken.

   The amount of time necessary to teach dentistry for children and orthodontics may depend, in a number of schools, on the relative allocations of teaching time to this interdepartmental area of dentistry for child patients. Perhaps a decision can best be based on a cooperative "gentlemen's agreement" between the two departments. Wylie, in a statement regarding the lack of conflict in concepts between the orthodontist and the children's dentist, which he published late in 1950,[4] suggests ". . . we always have joined in our common cause to provide a functional dentition in an optimal state of health commensurate with the age of the child, for every child." Committee members concur.
7. *Public Health Dentistry.* Questions were included in the survey to gather opinions on the assignment of the teaching of public health dentistry. Here, again, the committee found that confusion of definition exists, that some faculties think of dentistry for children and public health dentistry as synonymous functions of practice.

As recently as 1948,[5] the House of Delegates of the American Medical Association formulated and adopted a definition of public health as, ". . . the art and science of maintaining, protecting and improving the health of the people through organized community efforts. It includes those arrangements whereby the community provides medical services for special groups of persons and is concerned with prevention or control of disease, with persons requiring hospitalization, in order to protect the

community, and with the medically indigent." The committee, at this moment, would welcome a definition of public health dentistry by the House of Delegates of the American Dental Association.

It may be questioned, the committee concludes, that public health dentistry should be classified as an enterprise of dental practice for children. It so concludes in view of the well-established university schools of public health which now are teaching a rather large number of clearly defined professional disciplines, some of which are quite thoroughly intertwined with the content of the social sciences. It so concludes further as it recalls that about the largest program of public health dentistry in the United States, one in the American Medical Association's category of "special groups," is the dental program of the Veterans' Administration.

5. Implications for Research

Insofar as recommendations regarding research to be prosecuted for the better teaching and the better practice of dentistry for children are concerned, the committee felt that a reasonable statement could be made: research in the supporting courses such as therapeutics and dental materials is well underway and requires only encouragement; research in caries control technics has achieved considerable momentum and requires, therefore, little further stimulation; research to complete the appraisal of the role of devitalized teeth in systemic disease is needed badly, but current research activity with the products of the pituitary-adrenal system may be expected to throw light on the etiology of the group collagen tissue diseases so frequently ascribed in the past to dental focal infection in childhood or adult life; research to determine the age periods affected by incipient periodontal disease is just begun and requires encouragement; and finally, research on the etiology of malocclusion already has become damaging to the prestige of "mechanical" causation and now is focusing attention on the part played by heredity. To help the children's dentist most fruitfully, and probably the orthodontist as well, many more serial studies are needed to determine in a better way how individual children grow, how arches and occlusions develop, and how developmental and behavior patterns unfold.

This abbreviated statement regarding helpful research concludes the summation of committee recommendations for the program in dentistry for children. The committee, of course, realizes that the extent of an undergraduate student's experience in prosthodontic, surgical and pulp management procedures for children, and in the diagnosis and treatment of a number of oral aberrations, due to maldevelopment or systemic disease, will have to be determined by school facilities, by hospital con-

nections and by time limitations. On the other hand, the breadth of student experience also can depend partly on the extent to which a faculty is willing, without any loss of fine technical training, to exchange emphasis on adult patients for emphasis on child patients. Committee members, mindful that forty years of enlarging public pressures, the current high percentage of unmet dental needs and the impact of recent research, already highlighted in this afternoon's report, contribute powerfully to the focusing of oral health care on the child patient as a logical treatment unit. Trusting further that their analysis and discussion of the present survey material have achieved accurate conclusions and sensible recommendations, the committee members now rest their case.

Every undergraduate's experience with dentistry for child patients should proceed as far as a balanced total curriculum will permit; this experience should serve both as his ground work for the private practice of scientific family dentistry or as student preparation for more intensive advanced study. There can be little doubt, this committee would like to repeat, that the optimum period in which to institute and maintain scientifically adequate oral health treatment for the patient is during the period of childhood when the adequacy and permanence of the adult dentition is being established.

REFERENCES

[1]O'Rourke, J. T., and Miner, L. M. S.: Dental Education in the United States; Philadelphia, Saunders, 1941; XVIII, 367 pages (p. 126).

[2]Personal communication, Dr. J. Ben Robinson, Dean, University of Maryland Dental School—3840 to 4896 clock hours.

[3]Massler, Maury: Periodontal Disease in Children, pages 86-9. (In Schour, Isaac, and Levy, Saul, eds.: Current Advances in Dentistry, 1950-1951; Chicago, University of Illinois Press, 1950; 129 pages.)

[4]Wylie, W. L.: Dentistry for Children; *Calif. S. Dent. A. J.*, *26*, 284-8, 308; 1950 (Dec.).

[5]Report of the Council on Medical Service; *Am. Med. A. J.*, *138*, 685. (Oct. 30, 1948).

COLLEGE NEWS

Edited by SIDNEY EPSTEIN, D.D.S., *San Francisco*

University of Buffalo:

ERRATA

In the January issue of the JOURNAL, announcement was made of the appointment of Dr. S. Howard Payne as assistant dean and as a Fellow of the Academy of Denture Prosthesis. He is assistant dean but the other should read Associate Fellow of the Academy of Denture Prosthesis.

ANNOUNCEMENT

Ground breaking for new building, April 6, 1951.

Columbia University:

ANNOUNCEMENT

Announcement is made by the Council on Dental Education of the American Dental Association that approval has been granted to the School of Dental and Oral Surgery of Columbia University.

Emory University:

ANNOUNCEMENT

A woman, who knows very little about oral histology, has been granted honorary fellowship in O.K.U., Lambda Chapter. This woman is Mrs. DeLoss L. Hill, whose husband not too many years ago was a most important member of the American Dental Association. She herself is a benefactress to the School of Dentistry, Emory University, in the establishment of the Children's Clinic. (All of us can say "All Hail" to Mrs. Hill.—Ed.)

University of Illinois:

ANNOUNCEMENTS

Plans are out for a proposed unit of the Dentistry-Medicine-Pharmacy building.

Dr. Wm. Ward Wainwright, professor and head of the department of radiology, will be the moderator in a course of instruction entitled "Roentgenology in Dental Practice" beginning March 6th and extending over a period of six weeks.

The U. S. Public Health Service has made a further grant for the study of neoplastic changes in oral epithelium and supporting structure induced by radioactive materials.

Major Marvin Carius, '46, with two infantrymen, converted a truck into a dental laboratory called "Halitosis" following soldiers to the front lines. He served many patients but was killed in action December 2d.

Dr. Edgar H. A. Kramp died suddenly following a heart attack.

The assignment of patent rights covering the combination of dibasic amonium phosphate and carbomide used in dentifrices has been made and completed in favor of the University of Illinois Foundation, a non-profit corporation. This has been accomplished through Dr. Edward C. Wach of the university.

Dr. Donald A. Wallace, former secretary of the Council on Dental Therapeutics of the American Dental Association, has been appointed associate professor of applied materia medica and therapeutics. He is to make further investigation concerning the dental plaque and its behavior in the presence of various inhibitory agents.

PROMOTIONS

Dr. Charles G. Maurice, assistant professor, applied materia medica and therapeutics—formerly instructor.

University of Iowa:

APPOINTMENTS

Oliver E. Wilson, D.D.S., instructor, orthodontia; Robert E. Leighton, D.D.S., assistant professor and acting head, de-

partment of preventive dentistry and pedodontia; W. R. Kern, D.D.S., and P. W. Herrick, D.D.S., assistant professors, clinical crown and bridge prosthesis.

Medical College of Virginia:

ANNOUNCEMENT

Harry Lyons, D.D.S., professor, periodontia and oral pathology, has been made dean of the school.

APPOINTMENTS

Frederick M. Salisbury, D.D.S., assistant Professor, denture prosthesis.

Holmes T. Knighton, D.D.S., formerly Washington University, professor bacteriology, and clinical instructor in dentistry.

N. R. Callaghan, D.D.S., formerly Iowa State University, assistant professor, denture prosthesis.

F. W. Salisbury, D.D.S., assistant professor, denture prosthesis.

H. R. Boyd, D.D.S., formerly U. S. Army, instructor, crown and bridge, and denture prosthesis.

University of Minnesota:

ANNOUNCEMENT

Fellowships and teaching assistantships are available for a limited number of graduate students in various fields of dentistry.

The sixth annual seminar in oral medicine will be held in September.

New York University:

ANNOUNCEMENTS

Dr. F. J. Bronner, professor, comparative anatomy and dental morphology and occlusion, has been awarded Knighthood of the Royal Order of St. Olaf by the Norwegian Government.

Graduate work in periodontia is also announced.

Ohio State University:

ANNOUNCEMENTS

The new dental building is completed and was put to general use in January, 1951.

Graduate courses in orthodontics are now offered at Ohio State with a faculty consisting of Drs. E. G. Jones, L. F. Edwards, J. R. Hull, R. M. Kincaid, P. C. Kitchin, D. C. Miller, H. B. G. Robinson and R. E. Wade.

University of Pennsylvania:

APPOINTMENT

Miss Esther Dechant, administrative assistant to the dean.

ANNOUNCEMENT

The University of Pennsylvania, through its dental faculty, is very active in dental and intra-professional work, including as well civic responsibilities. The dean says "running this school is a big job and needs lots of help and ideas."

Dr. J. J. Bentman, consultant in periodontology, Veterans' Administration.

Temple University:

ANNOUNCEMENTS

Announcement is made of a short graduate course in orthodontics under the direction of Dr. Robert H. W. Strang.

Plans are developing for the annual meeting of the American Association for Cleft Palate Rehabilitation to be held at the school in April.

Announcement is made of the loss by death of two members of the faculty, Dr. Richard Galely, instructor, crown and bridge prosthesis, and Dr. Stanley Nowinski, instructor in pedodontics.

National Bureau of Standards:

This bureau, which is of no small interest to dentists, dentistry and dental schools, has recently had tribute paid to it by the American Crystallographic Association. A commemorative scroll was presented by the president of A.C.A. in February, 1951. This statement was made here in order that our member schools might keep names of these associations in mind and they are of interest to us.

BOOK ANNOUNCEMENTS

Current Therapy 1951: This is the 1951 edition of this book edited by Howard F. Conn, M.D., and twelve consulting editors who are well-known medical men nationally. It consists of case discussion and treatment by many different men, of many different ailments in many different geographic locations, each being devoted to one ailment, diagnosis, treatment and prognosis. It no doubt serves a very useful purpose in the office of the practicing physician and will be useful to a degree in a dental office so far as a particular dental condition might be related to a particular condition. The book is well printed with an attractive format, consisting of 699 pages, with an index.

Published by W. B. Saunders Co., Philadelphia. Price $10.00.

Exodontia: This is the fourth and completely new edition of this book by M. H. Feldman, D.D.S., F.I.C.A. The author is well known within the dental profession, as is also his work. He is director of dentistry, Lincoln Hospital, New York City. The book consists of 390 pages with 322 illustrations and an index.

Published by Lea and Febiger, Philadelphia. Price $6.50.

Journal of Prosthetic Dentistry. This is the name under which a new quarterly journal, official publication of the Academy of Denture Prosthetics, the American Denture Society and the Pacific Coast Society of Prosthodontics is published, and edited by Dr. Carl O. Boucher, Ohio State University. This journal will no doubt find a welcome response among prosthetists over the country.

The Neuroses: *Diagnosis and Management of Functional Disorders and Minor Psychoses*, by Walter C. Alvarez, M.D., Professor of Medicine, Emeritus, Mayo Foundation, University of Minnesota; Emeritus Consultant in Medicine, the Mayo Clinic. 667 pages. Philadelphia and London: W. B. Saunders Company, 1951. Price $10.00.

Accepted Dental Remedies. Published by the American Dental Association, Chicago, Illinois. This publication is designed to serve as a handbook of dental therapeutics. In addition it contains a list of therapeutic products marketed in the United States which are acceptable to the Council on Dental Therapeutics. The book contains 222 pages, including a general index and a manufacturers' index, and sells for $1.50 a copy.

Health of Ferrous Foundrymen. This is the title of Public Health Service Publication No. 31, put out by the Federal Security Agency. It represents a study of the health of iron workers, conducted by the U. S. Public Service and the Illinois Department of Public Health. It is another study of occupational problems.

A dozen or more pages are devoted to a study of dental conditions, resulting in the following summary:

"Dental status in terms of decayed, missing, and filled teeth of the white foundry workers was observed to be similar to that of other industrial workers studied.

"Data concerning selected abnormalities of the soft tissues and supporting structures are presented.

"The abrasive dusts in the atmosphere of the foundry accentuated the wearing away of tooth surfaces."

Abrasion of the teeth by dust in the air appears to be the greater difficulty, so far as dental structures are concerned. There is no real difference in effect on white or non-white workers.

The publication may be had from the

Federal Security Agency Public Health Service, Washington, D. C.

Index, Dental Periodic Literature. This statement carries the announcement of two volumes of this well known and valuable contribution to dental literature. Heretofore it has been published triennially, but with the new system, the cumulative type, it is published annually. A so-called quarterly cumulative index is now published, which allows condensation into one annual volume. In this instance, however, one volume carries two years, 1948 and 1949, the other, 1950 being the first annual volume.

It is arranged in alphabetical order with regard to author and subject headings, including original articles, editorials and an extensive obituary coverage. This makes for easy location of material desired and the extensive obituary allows for a better historical search for persons as well as permitting payment of respect to those who have been a part of the profession.

No list of subject headings can be complete for any length of time, in fact changes come very rapidly, hence, in the back of each volume will be found a list of new or additional subject headings.

Published by the American Dental Association, 222 E. Superior Street, Chicago, Ill. Price, 1948-1949 volume, $10.00; 1950 volume

Nitrous Oxide-Oxygen Anesthesia. This is a new third edition of the same book. It is unique in its field, covering technical details for anesthesis, both medical and dental. This third edition is enlarged, containing minute details on the use of nitrous oxide and curare.

The author is F. W. Clement, M.D., diplomate, American Board of Anesthesiology; chairman of the section on Anesthesiology of the A.M.A., 1950; formerly director of anesthesia at Flower Hospital; Mercy Hospital; the State Hospital for the Insane, Toledo, Ohio, etc.

It contains 369 pages, with an index and 129 illustrations. Published by Lea & Febiger, Philadelphia 6, Pa. Price $6.00.

X-Ray Diagnosis: A Textbook. This is the title of a book, second edition, by seventeen British authors and edited by S. Cochrane Shanks, M.D., F.R.C.P., F.R.P., director, X-Ray Diagnostic Department, University College Hospital, London; and Peter Kerley, M.D., F.R.C.P., F.F.R., D.M.R.E., director, X-Ray Department, Westminister Hospital, and radiologist, Royal Chest Hospital, London.

This book consists of five parts, Central Nervous System, Teeth and Jaws, Eye, Nasal Sinuses, and the Temporal Bone. There are five volumes of the complete text, this being Volume I. It consists of 434 pages, including an index, and 439 illustrations. It is a book of teaching value, as it is a textbook, but it is also one of value to the pathologist, anatomist, radiologist and the clinician, both physician and the dentist. Published by W. B. Saunders Company, Philadelphia. Price, $12.50.

History of the Northwest Indiana Dental Society. This is a nice little story about this society and its development over the years. It is a type of what ought to be done more extensively, thus providing an intimate and a detailed history of dentistry.

The Development of Professional Education. This is the title of a 58-page monograph by Robert E. Doherty, president of the Carnegie Institute of Technology, from 1936 until 1950. It was published with the idea of making available "in his own words the education of thinking which has guided the reconstruction of professional education at Carnegie."

This should be very valuable to dental

teachers and administrators. Published by Carnegie Press, Carnegie Institute of Technology, Pittsburg, Pa. Price, $1.00.

What Would You Do? This is the title of a book by Dr. Daniel J. Fleming, for 30 years or more professor of missions in Union Theological Seminary. In this book the author discusses the conflict between christian and non-christian cultures. It is one, therefore, which would give to the average reader a concept of a field outside of our own profession, also guided by ethical conduct; hence, another approach to the general subject of ethics as required in the professional field. Published by Friendship Press, New York. Price $2.25.

The Law and Ethics of Dental Practice. This is a little book of 98 pages, including an index, discussing the questions as indicated in the title very thoroughly. There may be some difference in wording or expression or perhaps in action due to political differences between two countries. Yet basically ethics is ethics, right is right, and wrong is wrong no matter what country or where. This is an English publication by R. W. Durand, M.R.C.L., L.R.C.P., formerly secretary to the Medical Protective Society, and D. Morgan, L.D.L. (Leeds), formerly deputy dental secretary of the British Dental Association. It is well worth reading and will be helpful in many respects. Published by Hodder & Stoughton, London. Price 7/6 net.

American Dental Directory. The new 1950 edition of the American Dental Directory, listing the names and addresses of all licensed members of the dental profession in the United States, is now being distributed by the American Dental Association.

The first edition of the directory since 1947, the new publication includes the names of 86,876 dentists. Names are listed alphabetically and by states and cities. Each dentist is identified as to his membership or non-membership in the A.D.A., the character of his practice, the name of the school from which he was graduated and the year of his graduation.

A new feature of the 1950 edition is a separate geographical list of dental specialists. Other features include lists of state and district dental societies, dental schools, dental publications and their editors, a table showing license reciprocity, arrangements among the various states, data on the distribution of dentists throughout the nation, a list of requirements for licensure as established by state examining boards and a brief history of the A.D.A.

Secured through Order Department, American Dental Association, 222 East Superior Street, Chicago 11, Illinois. Price, $12.50.

International Dental Journal. This is the official journal of the International Dental Federation (De La Federation Dentaire Internationale) and published by that body. Volume I, No. 1, for September, 1950, made its appearance during the fall. Consisting of 160 pages, published in English and French, it should and will serve a useful purpose in keeping the dental world posted as to what is going on within the world. It is edited by H. H. Stones, M.D., M.D.S., F.D.S.R.C.S., University of Liverpool, England. The leading article in this first number is by Dr. Harry B. Frisbie, associate professor, oral histology and oral pathology, University of California, College of Dentistry, on the subject, "The Modern Concept of the Etiology of Dental Caries: Proteolytic Theories."

Issued Quarterly. Annual subscription, £2. 5s. 0. Distributed by Cassell Company, Ltd., 37/38 St. Andrew's Hill, London, E. C. 4.

Leadership in Dentistry: Laboratory Relations. This is a book of 187 pages, including an index and an appendix of 26 pages. It is intended to indicate the role played by this relationship in American dental culture. It consists of papers presented at the first Workshop on Trends in Dentistry-Trade-Laboratory Relations, edited by Alfred J. Asgis, D.D.S.

This little book will undoubtedly serve a useful purpose in the solution of the knotty problem which has been before the profession for so long a time. Each of us as individuals in society and as groups within the cosmic whole has a function to perform, a niche to fill. No one can tell the other where he belongs, but as the result of a long "trial and error" method of experimentation, each will find his place. Thus will it be with the workshop and the publication of their proceedings, the right place for the right person or group will be found. The smart man or men are not they who solve their problems, for they cannot. But the smart man is he who sees the solution when it manifests itself, having carefully guarded the steps leading up to that manifestation. The book is published by the Joint Dental Trade and Laboratory Relations Committee of the First, Second and Third District Societies of the State of New York. It may be secured by addressing the editor, 7 E. 42nd St., New York 17. Price quoted on application.

Caries Research. This is a Bibliography on Caries Research, prepared and issued by the Associate Committee on Dental Research of the National Research Council of Canada, edited by J. Stanley Bagnall, D.D.S., F.D.S.R.C.S., Ottawa.

This is a book of 557 pages, with a bibliography of 2274 references. It is well printed in offset printing, well bound and should serve a useful purpose among researchers and any interested in knowing the authorities in the study of the cause of dental caries. It is a worthwhile reminder of the advances made in dental research during the past quarter of a century or more, although it covers the literature from 1890. It is evidence, per se, of the development of the dental profession, and is a credit to the Canadian Dental Association as well as those immediately involved in its production.

It contains a description of the committee and its objects; a foreword by the chairman, Dr. Roy G. Ellis, Dean, Faculty of Dentistry, University of Toronto; and introduction, and a table of contents. It is a job well done.

Published by the National Research Council, Ottawa, Canada. Price, $10.00.

Annual Report: General Education Board (1950). This is the annual report of the board founded by the late John D. Rockefeller, showing the use and distribution of funds of that institution. Copies may be had by addressing the board at 49 West 49th Street, New York City.

Oral Physiology. This is a book of 333 pages, including an index and a moderately extensive list of references. It was originally written by the late John T. O'Rourke, B.S., D.D.S., Sc.D., and edited by Leroy M. S. Miner, M.D., D.M.D., Sc.D., Dr.P.H. It has been rewritten and brought up-to-date within the year 1951 by the editor, Dr. Miner. Published by The C. V. Mosby Company, St. Louis. Price, $5.00.

Anesthesia in Dental Surgery. This is the second edition of this book by Sterling V. Mead, D.D.S., M.S., B.S., well-known oral surgeon, Washington, D. C., and a past president of the American Dental Association. It consists of 648 pages with an index and 212 illustrations. Published by C. V. Mosby Company, St. Louis. Price, $12.50.

Oral Rehabilitation. This is a new book by the author, Jerome M. Schweitzer, B.S., D.D.S., New York City, being far more extensive in its scope than a former book by him. He enjoys various hospital connections and he is used extensively as graduate instructor in prosthetics. The book consists of 1161 pages, including an index and 1157 illustrations. Published by C. V. Mosby Company, St. Louis. Price, $20.00.

History of Dentistry, South Jersey. This little book of 198 pages is the story of the Southern Dental Society of the State of New Jersey, as that society has been connected with the development of dentistry in that area. It is edited by Milton B. Asbell, D.D.S., historian for this society. The southern society and the editor are to be congratulated on a job well done. More societies should do the same thing.

INDEX

Volume 15: 1950-1951

ADDRESS(ES): aims and ends of predental program, 51

Agnew, R. G.: local and systemic aspects of diagnostic teaching in dentistry, 174

Aids: teaching; use of plastics in making models, 192

Albertson, G. L.: See Gwinn, C. D.

Anatomy: planning forces in teaching, 34

Appleton, J. L. T.: letter to deans (editorial), 130

Arnold, F. A., Jr., and Zander, H. A.: research in dentistry for children, 236

Ashton, J. W.: address; aims and ends of predental program, 51

BASIC SCIENCES: teaching in dentistry for children, 184; *see also*, sciences, basic

Blauch, L. E.: teaching dentistry for children, introduction, 222

Book Announcements: 44, 124, 203, 272

Brauer, J. C.: development of pattern of instruction, 241

Breese, L. E., et al.: teaching endodontia, symposium, 60-79

Bridge and Crown: prosthesis, objectives in preclinical teaching, 11-25; teaching preclinical, 80-96

Brown, D. W.: See Breese, L. E. et al.

CHEMISTRY: high school, study of effects on oral hygiene grades, 8

Cleveland, J. L., Jr.: See Sturdevant, R. E. et al.

College News: 40, 121, 200, 270

Crown and Bridge: prosthesis, objectives in preclinical teaching, 11-25; teaching preclinical, 80-96

DENTAL EDUCATION: council of (photo), 199

Dental School(s): enrollment (editorial), 130

Dentistry: autonomy in, 210; for children, a complete study of the teaching program, 222-269; teaching, 25-33; why, 209; history of, 209; on teaching for children (editorial), 209; philosophy of, 211

Diagnosis: oral (editorial), 7; teaching, local and systemic aspects, 174

Dressel, R. P.: See Leander, C. T. et al.

EASLICK, K. A.: dentistry for children, a recommended undergraduate program, 259; present study of the program, 222

Editorial(s): dental roentgenology, medical diagnosis, 5; my students hate me, 129; on teaching dentistry for children, 209; oral diagnosis, 7

Education: dental, change in aims due to teaching periodontology, 109; council of (photo), 199

Endocrine (Glands): influence on etiology of oral lesions, 164

Endodontia: teaching, part of operative dentistry, 60; part of oral pathology, 73

FOCI: ORAL: See oral foci, etc., 160

Freeman, C. W.: teaching oral surgery, correlation with basic sciences, 144

Fulton, John T.: public interest in expansion of oral health care for children, 223

GILL, J. R.: See Sturdevant, R. E., et al.

Glands: influence on etiology of mouth lesions, adrenal, 167; gonads, 167; other hormones, 173; pancreas, 169; pituitary, 166; thyroid, 172

Glickman, I.: change in aims of dental education, 109

Grimm, D. H.: See Gwinn, C. D.

Gwinn, C. D. et al.: a technic for making teaching models for use in oral surgery, 213

HABERMAN, S.: application of bacteriological and pathological laboratories, 147

Hunt, Josephine P.: the library corner, 42

Hygiene: oral, study of effects of high school chemistry on grades, 8

INDEX: vol. 15, 277

Infection: oral foci, new concepts of, 160

Ireland, R. L.: a survey, 252

KESEL, R. G.: See Breese, L. E. et al.

Knutson, J. W.: oral health needs, including personnel facilities and plans, 231

Kolmer, J. A.: teaching internal medicine at Temple University, 132

LABORATORY(S): approach, in teaching, 154; bacteriological and pathological, 147

Leander, C. T., et al.: teaching preclinical crown and bridge, 80-96

Leonard, H. J.: status of periodontology in undergraduate curriculum, 97

Library: the corner, 42

MARTIN, Ruth E.: content of teaching program, 246. See, also, Wilbur, H. M., et al.

Medicine: teaching internal, Temple University, 132

Miller, S. C.: laboratory approach in teaching and diagnosis, value of, 154; students hate me (editorial), 129

NUCKOLLS, Jas.: endocrine influence on etiology of oral lesions, 164

Newlin, Jean E.: study of effects of high school chemistry on oral hygiene grades, 8

Nuttall, E. B.: See Sturdevant, R. E., et al.

OBITUARY(IES): 123

Operative Dentistry: includes teaching of endodontia, 60

Oral Surgery: models for technic teaching, 213; correlation of basic sciences with clinical practice, 144

PATHOLOGY: oral, includes teaching of endodontia, 73

Pettit, L. S.: See Wilbur, H. M., et al.

Periodontia: teaching of, 97-120

Periodontology: change in aims of dental education, 109; status in undergraduate curriculum, 97

Plastic(s): materials, in making teaching aids in denture prosthesis, 192

Prosthesis: crown and bridge, objectives in preclinical teachings, 11-25; teaching preclinical phase, 80-96; denture, use of plastic materials in making teaching aids, 192

RABINOVITCH, B. Z.: basic sciences, teaching dentistry for children, 184

Roentgenology: dental, in medical diagnosis (editorial), 5

SCHOOL: dental, enrollment (editorial), 130

Science(s): basic, correlation with clinical practice in teaching, 144; in teaching dentistry for children, 184

Smith, R. V.: See Sturdevant, R. E., et al.

Stafne, E. C.: editorial, dental roentgenology in medical diagnosis, 5

Starr, F. C.: See Leander, C. T., et al.

Sturdevant, R. E., et al.: conference session, crown and bridge prosthesis, objectives in preclinical teaching, 11-25

Surgery: oral: See oral surgery.

TEACH(ER)(ING): anatomy, planning forces in, 34; dentistry for children, introduction, 222; a recommended undergraduate program, 259; a survey, 252; basic sciences, 184; content of teaching program, 246; dental technics, 132; development of pattern of instruction, 241; oral health needs including personnel facilities and plans, 231; panel discussion, 25-33; public interest in expansion of oral health care, 223; relationship to instruction in other fields, 255; research in, 236; the present study of program, 222; endodontia, a symposium, 60-79; internal medicine, Temple University, 132; oral diagnosis, application of bacteriological and pathological laboratories, 147; local and systemic aspects of diagnosis, 174; new concepts of oral infection, 160; values in laboratory approach, 154; oral surgery, correlation of basic sciences with clinical practice, 144; periodontia, 97-120; preclinical, crown and bridge, prosthesis, 80-96; objectives in crown and bridge prosthesis, 11-25; technic models in oral surgery, 213; use of plastic materials in making teaching aids for denture prosthesis, 192

Teuscher, G. W.: dental technics, teaching dentistry for children, 182

Technics: dental, teaching dentistry for children, 182

Thomas, B. O. A.: See Breese, L. E., et al.

WEISENGREEN, H. H., and Wiswell, O. B.: planning forces in teaching anatomy, 34

Wilbur, H. M., et al.: panel discussion, dentistry for children, 25-33; relationship of instruction in dentistry for children to instruction in other fields of dental service, 255

Wiswell, O. B.: See Weisengreen, H. H., and Wiswell, O. B.

Wolfe, W. R., Jr.: See Wilbur, H. M., et al.

YORK, D. H.: See Leander, C. T., et al.

ZANDER, H. A.: See Arnold, F. A., and Zander, H. A.

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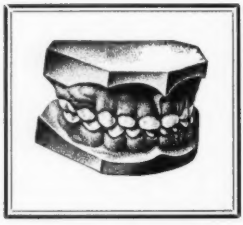

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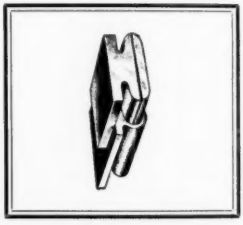

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